The fur traders and fur bearing animals

Marcus Petersen

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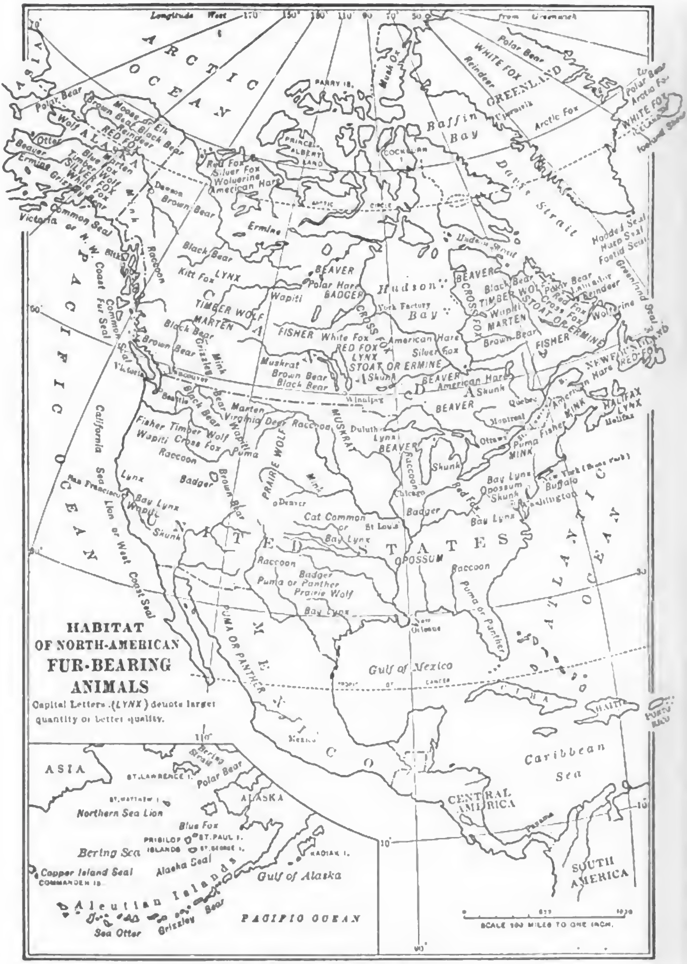

HABITAT OF NORTH-AMERICAN FUR-BEARING ANIMALS

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The Fur Traders
and
Fur Bearing Animals

BY

MARCUS PETERSEN

AUTHOR OF

"THE WEASEL FAMILY AND ITS ALLIES;" "SEALS—THEIR PRODUCTS, HABITAT AND HABITS;" "SOME FUR BEARING ANIMALS"

FULLY ILLUSTRATED

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INTRODUCTION

How little we know and how much there is to learn. Research and investigation along any given line show how incomplete is our knowledge even of the things with which we are most familiar. There is nothing new under the sun, but there is always something we do not understand about the subjects to which we have given the most thought and study. The scientist who knows all about the origin of a species, sometimes has the least knowledge as to how it can best be conserved, or of its real worth to the community, while the breeder who thoroughly understands propagation problems, and the dealer who can exactly estimate the value of the products of fur bearing animals, often know little about their origin, nature, habits and habitat.

The object of this volume is to bring within the reach of each of these classes the information possessed by the others; and to give to students of natural history and the general public a synopsis of everything of value that has been written by others upon this subject, together with many facts that heretofore have not been matters of general information.

The author has not attempted to write a new history of any part of the Animal Kingdom, but to present in condensed form and simple language authentic information regarding the structural formation, external appearance and distinguishing features of the more important fur-bearing animals; and to show by comprehensive charts and tables the proper grouping, and the relations and affinities each to each, of the different species. Attention has also been given to Fur Farming, and the commercial value of the different skins; the quantities of each used annually by furriers in pursuit of their calling;

the processes and methods employed in dressing, dyeing and improving the skins; and the rules by which the experts determine their values.

Considerable time has been devoted to the preparation of a map showing where the finest specimens of the North American mammals are obtained, and to the compilation of a Lexicon giving the English, French, German and Spanish names of the different animals, and the trade designations applied to the furs made from the various pelts.

Fanciful exaggerations have been carefully avoided; but the facts presented regarding the intelligence and sagacity of some of the species add to the interest of the book.

While it was impossible to tell the whole story in the first paragraph, it has been told in as few words as possible, so that this work is in reality a text book, where the important facts about the fur-bearing animals and their products are so arranged that the reader can readily find the data that could be obtained elsewhere only by long and patient research through the works of many writers. Those who may desire more detailed information are referred to the following authorities which have been consulted, and in some cases freely quoted, by the author of this volume.

Baron Cuvier's "Animal Kingdom;" Richard Lydecker's "Royal Natural History;" John Sterling Kingsley's "Riverside Natural History;" Henry Fairfield Osborne's "Age of Mammals;" Henry Poland's "Fur Bearing Animals;" Captain Hiram Martin Chittenden's "Fur Traders of the Far West;" Washington Irving's "Astoria;" Sir Alexander McKenzie's "Voyages From Montreal;" George Bryce's "History of The Hudson's Bay Company;" Alexander Beggs' "History of the North West;" P. L. Simmonds' "Animal Products;" the memoirs of Gabriel Franchere, Alexander Ross and F. A. Laroche; the reports of the investigations made by D. G. Elliott, Dr. E. Coues and Wilfred H. Osgood; the writings of Linnaeus, Buffron, Lamarck, Bell, Darwin, Professor Huxley, Henri LeCourt, W. T. Hornaday, Dr. Theodore Gill, R. Ramsey Wright, W. H. Blundell and W. N. Lockington; and the Government reports issued by the United States Department of Agriculture, and the Bureau of Fisheries of the Department of Commerce.

The helpful co-operation of my wife, the courtesies extended to me by Dr. Francis A. Crandall, Jr., curator of the Buffalo Park Zoo, and many others whose names are not mentioned, and the assistance given by my publisher, Mr. H. A. Hammond of Buffalo, are gratefully acknowledged.

"KNOWLEDGE IS POWER"

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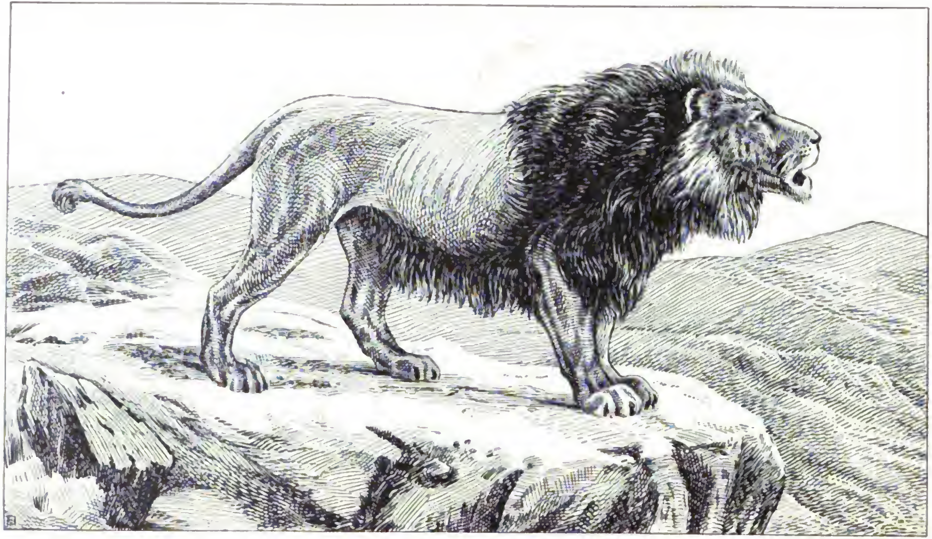


A CALL FROM THE WILD.

UNIV. OF CALIFORN.

THE FUR TRADERS.

The use of skins for winter garments dates back to the period when the groves were God's first temples, and a man's wants were limited to his necessities. It is a long call back to the time when the Patriarchs clothed themselves in the skins of the animals they had slain in the primeval forests from the present day when furs are often worn, like pearls and diamonds, for ornament rather than the protection they afford the wearer, and in some cases are so valuable that a fashionable woman's collection of furs is often worth more than a king's ransom. All through the intervening centuries peltries have formed an important article of traffic, even though the ingenuity of man, in inventing processes for the manufacture of other materials from which to fashion his garments, has in many cases caused the furs to become a subsidiary luxury instead of a primary necessity.

One of the oldest guilds in the city of London is the Skinners' Company which was originally a combination of fur traders, but at a later period the "Upholders" and "Tawas," as the furriers and skin dealers were then respectively called were admitted to membership. There are no documents from which the particulars of its origin, or the date of its founding, can be traced; but it is interesting to note that a charter granted the company on March 1st, 1327, by King Edward III of England, contains a provision that the members must not sell old fur for new. A second charter granted by Henry VI, on February 24, 1437, gave the company authority to regulate the exposure of furs for sale and the mixing of old and new furs; as well as the right to scrutinize the work, places of business, and the wares offered for sale by the furriers in London and other parts of the Kingdom. Evidently even at that early day there were those who were bringing reproach upon an honorable calling by taking advantage of the opportunities for deception offered by the fur trade.

Charles I, seized and confiscated the lands of the Skinners' Company, but they were returned to them later.

On June 28, 1667, Charles II granted a new charter, which again gave the company jurisdiction over the manufacture of furs, muffs, and linings for fur garments; and the cutting, clipping and dividing of the wool from the pelts. By this charter they were also given authority to sue and seize wares, and the power to search out offenders against the law of the guild and to present them before the proper authorities for punishment. Another provision of this charter limited the time of service of apprentices to seven years.

The Skinners' Company has long since ceased to exercise jurisdiction over the fur trade in England, but it still has a corporate existence and owns property in London and the north of Ireland.

The ancient name of this company was the "Guild or Fraternity of the Body of Christ, of the Skinners of London."

The first fur traders on the North American continent were the French and Russian companies; the former taking possession in Canada in 1535, and the latter establishing their first station in the Northwest in 1553.

The West Indian Company, a Dutch organization which established headquarters in New York in 1621, shared for a time with the Plymouth Company of England a monopoly of the business of exporting beaver skins from the New World. The real history, however, of the development of the fur trade on the North American continent is found in the records of the Hudson's Bay Company, established under the patronage of Prince Rupert, on May 2, 1670, and those of the great French Merchants and the English and Scotch Traders, who for more than a century refused to recognize the rights of the Hudson's Bay Company to exclusive trading privileges on the shores of the bay and the rivers tributary to it, and who often contested their claims by force of arms.

The original title of the Hudson's Bay Company was, "The Governor and Company of Adventurers, Trading into Hudson's Bay." Its origin was as follows: In 1659, two French traders, Groeilliers and Radisson, made their way into the wilderness beyond Lake Superior, and having satisfied themselves of the practicability of reaching Hudson Bay by continuing overland to the north, returned to

Montreal with a load of furs. While they were making other journeys to the Northwest for exploration and profit, the French Government gave to other parties a patent conveying to them the exclusive right to trade in those regions. Groeilliers returned to France to protest against this action, and failing to obtain redress from his own government he went to England and succeeded in interesting Prince Rupert, under whose patronage he sailed for Hudson Bay in 1668. The success of this trip resulted in the granting of the charter which gave to the Hudson's Bay Company privileges such as no other company ever enjoyed before or since.

The trade of the company at first was small. The records show that in 1672 it only purchased 200 fowling pieces, 200 brass kettles, 12 gross of knives, and 900 hatchets; but the quantities of merchandise needed to carry on the trade with the Indians increased every year and other articles were steadily added. Fifteen years after the founding of the company they had fifteen forts; one at Albany River, two at Hayes River, three at Rupertsland, four at Port Nelson, and five at New Severn. In 1856, the company had forts in thirty-four districts, with about ten thousand whites and half-breeds and about forty-nine thousand Indians under their rule. The stock of the company in 1890, was divided into one hundred thousand shares, of a par value of fifteen pounds sterling each.

To convey a clear idea of the variety of articles in a trading equipment in the early part of the nineteenth century, as well as the prices they were rated at west of the Rockies in 1826, we publish an extract from a bill of sale by which on July 18, 1826, an outfit was transferred in Utah.

"Gun powder of the first and second quality at one dollar fifty per pound, lead at one dollar per pound, shot one dollar twenty-five cents per pound, three point blankets at nine dollars each, green ditto at eleven dollars each, scarlet cloth at six dollars per yard, blue ditto common quality from four to five dollars per yard, butcher knives at seventy-five cents each, two and a half point blankets at seven dollars each, North West fuzils at twenty-four dollars each, tin kettles different sizes at two dollars per pound, sheet iron kettles at two dollars twenty-five cents per pound, square axes at two dollars fifty cents each, beaver traps at nine dollars each, sugar at one dollar per pound, coffee at one dollar twenty-five cents a pound, raisins at one dollar fifty cents per pound, grey cloth of common quality at five dollars per yard, flannel common quality at one dollar fifty cents per yard, calicoes assorted at one dollar per yard, domestic cotton at one dollar twenty-five cents per yard, thread assorted at three dollars per pound, worsted binding at fifteen dollars per gross, finger rings at five dollars per gross, beads assorted at two dollars fifty cents per pound, vermillion at three dollars per pound, files assorted at two dollars fifty cents per pound, fourth proof rum reduced at thirteen dollars fifty cents per gallon, bridles assorted at seven dollars each, spurs at two dollars per pair, horse shoes and nails at two dollars per pound, tin pans assorted at two dollars per pound, handkerchiefs assorted at one dollar fifty cents each, ribbons assorted at three dollars per bolt, buttons at five dollars per gross, looking glasses at fifty cents each, flints at fifty cents per dozen, moccasin awls at twenty-five cents per dozen, tobacco at one dollar twenty-five cents per pound, copper kettles at three dollars per pound, iron buckles assorted at two dollars fifty cents per pound, fire steels at two dollars per pound, dried fruit at one dollar fifty cents per pound, shaving soap at two dollars per pound, first quality James River tobacco at one dollar seventy-five cents per pound, steel bracelets at one dollar fifty cents per pair, large brass wire at two dollars per pound."

At that time the wages of a hunter were four hundred dollars per year, and the common laborers about the
5 camp received two hundred per year. Buffalo skins were worth three dollars each, beavers four dollars each, otters three dollars each, raccoons twenty-five cents each, muskrats twenty cents each, and deer skins thirty-three cents per pound.

In estimating the profits of the traders we cannot figure the difference between the value of skins received and the factory cost of the merchandise exchanged for them; but must allow for an expense account, amounting to several hundred per cent. on the goods. There is no doubt that the net profit remaining was heavy for money seldom changed hands in these transactions, and whether buying from the Indians direct, or paying the trappers employed by them on a salary, or dealing with the free white hunters and trappers, the company settled nearly all its accounts in merchandise.

Washington Irving said that two great commercial pursuits were the "pioneer precursors of civilization on the Western Hemisphere—the search for gold and the traffic in peltries. The one led the Spaniards to explore the lands scorched by the tropic sun, and the other caused by buoyant Frenchman and the calculating Briton to penetrate the trackless forests of the north."

Every careful student of American history knows that the call of the wild alone withont any prospect of gain, while it might have attracted men to the luxuriant tropics, would hardly have induced them to push on into the frozen northland until the way to the Arctic Circle was opened up by their daring enterprise.

"It was because the early French adventurers who settled on the banks of the St. Lawrence River found that in the rich peltries of that territory they had sources of wealth that would rival the mines of Mexico and Peru," that they pressed ever further into the unexplored regions of the interior, establishing along the line of their progress the trading posts and supply stations which gradually evolved into the great commercial centers of Canada. When the rapid growth of the settlement at Montreal compelled the Indians to extend the circle of their hunting operations, many of the fur traders accompanied them in their expeditions to more distant regions, and in that way became acquainted with the best hunting grounds and the more remote tribes, and by trading direct with the Indians in their own country diverted much business from Montreal and the other places where the large organized companies had their stores.

As the Indians at that time had no real knowledge of values, and bartered the most precious furs for worthless trinkets and cheap commodities, the profits of these wandering traders were enormous; and on the rare occasions when they returned to Montreal to dispose of their collections and purchase new supplies they startled the settlers with their display of reckless prodigality.

It is not within the province of this work to follow the fortunes of these Couriers-des-bois or rangers of the woods, or to relate how their example corrupted the simple natives, among whom they spent most of their lives and of whom they took every unfair advantage, until the French Government issued an order prohibiting all persons from trading in the interior without a license in writing from the Governor-General under penalty of death. The facts stated have simply been mentioned to show how large and important a part the fur traders had in the development of the Northwest. They were for many years, lawless as some of them were, the only civilized beings in the country in which they operated; and but for the French voyageurs, and the English and Scotch adventurers and explorers working under the authority of the Hudson's Bay and the Northwest Companies, New Caledonia or British Columbia might never have been discovered, and Canada might still be shut out from access to the Pacific Ocean. It was the erection of fur trading posts by the French that aroused the jealousy of England and was the primary cause of the French and Indian War, which resulted in the overthrow of the French dominion in Canada. The Treaty of Paris, signed May 2, 1762, left England undisputed sovereign of North America, except to the west and southwest of the Mississippi and on the Pacific coast, and "marked the passing of the great French merchants who for generations had lived the lives of commercial patriarchs at their trading posts, in easy familiarity with their retainers and the train of Indians and canoe men of all nations always hanging about their establishments and eating and drinking at their expense." It also put a stop to the feuds and contests arising from the infringements of territorial limits, and the acts of violence and bloodshed that up to that time had been of frequent occurrence between the factors of the Hudson's Bay Company and the agents of the French merchants in Canada.

There was a period of depression after the Treaty of Paris. The Hudson's Bay Company when it found itself in control of the situation decided to trade only wtih the Indians direct as the surest way to prevent the extermination of the fur-bearing animals; and the Scotch merchants of Montreal, the natural successors to the French traders in the upper lake country, being uncertain as to territorial rights were for a time inactive. When they did begin operations they were at first ignorant of the country and distrustful of the natives; and the couriers-des-bois and other adventurers whom they tried to enlist in their service missed the indulgent freedom of the old trading houses, and did not take kindly to the haughty reserve and exacting methods of the British traders. With the revival of trade in 1766, came new rivalries and jealousies, until business was again injured by the efforts of the various individuals engaged in the traffic to outbid and undermine one another. The Indians were debauched by the sale of spirituous liquors which had been prohibited under the French rule, and once more scenes of drunkenness and brawls were frequent in the Indian villages and around the trading posts; while bloody conflicts often resulted when rival trading parties met "in the lawless depths of the wilderness."

It was to put an end to these conditions that the famous Northwest Company was organized in 1783 by the Montreal merchants under the directorship of Sir Alexander McKenzie; so that, instead of scattering their energies along a dozen or more individual lines of endeavor, the opposing forces might present a united front in their competition with the Hudson's Bay Company. The only organization whose rivalry the new company had cause to fear, Pond, Pangman & Co., was absorbed in 1787; and from that time on "the Northwest Company held lordly sway over the lakes and boundless forests of the Canadas" until it in turn was absorbed by the Hudson's Bay Company, in 1821. For nearly two generations the McTavishes, McGillivrays, McKenzies and Frobishers, who were the resident agents of the Northwest Company at Montreal and Quebec, formed a commercial aristocracy at those places, while the partners in charge of the interior stations, each with his score or more of retainers at his command, lived like Highland chieftains in their wilderness fastnesses. The headquarters of the Northwest Company were at Montreal, and its principal depot was at Grand Portage. Its operations extended into the Northwest between the Hudson Bay territory on the one side and Louisiana on the other. When a survey showed that the headquarters were on United States territory a new post was built further north and named Fort William. It was here that the annual dinners of the company were held. Irving says: "At these meetings the house swarmed with traders and voyageurs. The councils were held in great state, for every member of the company felt as if he were sitting in Parliament, and every dependent looked up to the assemblage with awe, as to the House of Lords.

"In the banquet hall, the tables groaned under the weight of delicacies and there was no stint of wine for this was a hard drinking period. While the chiefs thus reveled in the hall, and made the rafters ring with bursts of eloquence and song, their merriment was echoed and prolonged by the legions of white adventurers, half-breeds, Indian hunters, and vagabonds of every class, who feasted sumptuously outside on the crumbs that fell from the great men's tables."

The glory and wonderful success of the Northwest Company stimulated further enterprise in this "open, and apparently boundless, sea of profit;" and in 1795, a combination was formed by several partners who had retired from the Northwest Company because they were dissatisfied with the part allotted to them in the management of its affairs, and Forsyth, Richardson & Company, an independent Montreal firm that for a number of years had maintained a trade around Lake Superior, which resulted in the organization of a New Northwest Company or as it was more generally known, the X. Y. Company. This organization continued in existence until 1804. Another British company which was founded after the Northwest Company had started on its prosperous career was the Mackinaw Company, so named because its principal station was at Machilimackinac. It operated mainly within the territories of the United States upon the shores of Lake Michigan and westward to the Mississippi, and in Canadian territory east of Lake Erie.

Up to this period the fur trade in the United States had not been organized along any regular line; for while skins were casually collected by traders in their dealing with the Indians and white hunters, the main supply of furs used in the United States came from the Canadian companies.

"The Government of the United States had for some time viewed with apprehension the growing power of these foreign combinations among the native tribes upon its borders;" and in an effort to counteract their influence had as early as 1796, established rival trading posts on the American side of the frontier to secure the trade of the Indians within its own territory. The experiment was not successful. Then, as has proved to be the case so many times since, "the keen activity of private enterprise was more than a match for lethargic government patronage." The Government could not resort to the methods pursued by its competitors. Its representatives could not meet misrepresentation with misrepresentation, or secure the favor of the Indians by supplying them with liquor; the importance of this last fact will be realized by those who know how violent is the attachment of the Indian for liquor, and that he who gave the most of it was almost sure to obtain the furs. The Government was also bound to patronize only home industries, and this made it impossible for its agents always to give the natives the best article of its kind in exchange for their peltries; a fact upon which the private trader always enlarged to his advantage. Then, too, the Government was not permitted to extend credit to the Indians, while the private trader advanced the incompetent natives outfits on credit, and made sure of his payment by accompanying them on their hunting expeditions.

The "factory system" of 1796, was right in theory; but it failed in practice, because, as Captain Hiram Martin Chittenden says, in The American Fur Trade of the Far West, "the Government lacked the courage of its convictions. It should have taken the field to itself, just as it does in the carrying of mails, coining of money, and the making of war. Instead of doing this it granted trading licenses to private parties, and thus degraded itself to the level of a competing trader among a herd of irresponsible and frequently lawless rivals."

We may rail against "monopoly," protest against the "centralization of power" and talk wildly of the "rights of the individual," but the exercise of judicious authority in restraint of trade is often a benefit to the consumer as well as the producer—the buyer as well as the seller. When liberty degenerates into license it always becomes the worst kind of slavery. It certainly would have been better for the Indian to have taken his furs to the "factories" where he could get his goods at prices that would simply make the system self-sustaining, instead of dealing with traders who, in spite of their presents and plausible representations, were taking every advantage of his ignorance, and at the same time slandering one another to such a degree that the disgusted Indian finally became hostile to all Americans and traded entirely with the British agents who lived near the boundary. The overthrow of the factory system in March, 1822, as the result of this "open competition" of individual traders with the Government, robbed responsible American merchants of their main outlet for Indian supplies. and demonstrated that in a field "free for all" there is bound to be a commercial rivalry, in which it is not always the strongest or even the fittest, but very often the most unscrupulous who survive. Under such conditions even a monopoly is better than unrestrained competition.

What the Government failed to do was accomplished later by a private individual. John Jacob Astor, who was born at Waldorf, near Heidelberg, Germany, on July 17, 1763, had settled in New York in 1783; and after profitably disposing of the stock of musical merchandise which he had brought over with him from London, had followed the advice given him by a traveling companion and invested his capital in peltries, which he bought at Montreal and shipped to London and China. When the treaty of 1795 ceded to the United States, the military posts formerly occupied by the British, at Oswego, Niagara, Detroit, Machilimackinac, and other points on the American side of the Great Lakes; Mr. Astor, who had been very successful in his trading operations, saw an opportunity to gratify a long-cherished ambition to secure a monopoly of the fur trade in the United States. He began establishing trading posts of his own at the points mentioned, and along the Missouri and Nebraska Rivers into the country where the Missouri Company was operating. The situation then confronting Mr. Astor was this: The Hudson's Bay and Northwest Companies, who were struggling for supremacy in the country northwest from Lake Superior, had extended their southern line of operations well into the United States territory. The Mackinaw Company with other traders controlled the territory about the upper lakes, and westward to the Mississippi. The trade along the

Missouri and to the south was largely in the hands of the Missouri Company. Finding the power of these competing companies too great to be combatted by him individually he offered, if given aid and protection by the Government, to turn the whole fur trade of the continent into American channels. In 1809, being assured of Government support, he secured from the Legislature of the State of New York a charter incorporating the American Fur Company with a capital of one million dollars all of which was furnished by himself.

The Canadian companies still continued their rivalry; and Mr. Astor, feeling that the fur trade would not advantageously admit of this foreign competition because of the advantage which the restrictions placed by the United States Government upon its citizens in their dealings with the Indians gave to their competitors, who had a free hand in regard to the sale of liquor and other articles, made a new arrangement by which, in conjunction with certain partners of the Northwest Company, he bought out the Mackinaw Company. With the sanction of the United States Government he merged the Mackinaw Company and the American Company into a new corporation known as The South West Company. By this combination he came into immediate possession of half of the posts and goods belonging to the Mackinaw Company in the United States, with the understanding that the balance would be conveyed to the South West Company at the end of five years, if during that time no attempt was made by the American Company to trade within the British dominion. This merger was suspended by the War of 1812, and was finally entirely dissolved by an act of Congress prohibiting British fur companies from prosecuting their operations within the territory of the United States.

While the companies we have mentioned were pushing their various enterprises in the east; Captain Cook and others reported that vast quantities of sea otter were to be found along the Pacific coast, and that the skins of these animals were bringing fabulous prices in China. "It was as if a new gold field had been discovered. There was a rush of adventurers from all sections to join in this traffic, and, in 1792, twenty-one vessels, under different flags, but most of them owned by Boston merchants, were trading along the Pacific coast." These vessels would run in near the shore and anchor and wait for the natives to come off in their canoes with their peltries; and when trade was exhausted in one place, would sail on to another. Having collected a sufficient cargo of skins they would make their way to China, where they would sell their furs and lay in a stock of teas, nankeens, and other merchandise to carry back to Boston on their return, after an absence of from two to three years.

The Russians, instead of making casual trips, established regular trading stations in the high latitudes along the Northwest Coast of America and on the Aleutian Islands, under the control of a company incorporated by the Russian government, with a capital of $250,000 and exclusive trading privileges. The Russian crown at this time claimed sovereignty over all the territory in which its traders were operating, on the plea that the land had been discovered and occupied by its subjects. The company referred to was called the Russian Fur Company, and succeeded sixty or more smaller organizations that, up to that time, had divided the Pacific coast traffic among them. The headquarters of the company were at Sitka. It was dissolved in 1867, after the sale of Alaska to the United States.

As China was the great market for furs collected in this quarter the Russians had another great advantage over all their competitors, as they did not have to take their peltries to Canton for distribution through the empire, but were able to carry them on their own vessels by a shorter journey direct to those parts of the Chinese Empire where they were chiefly consumed, at a considerable saving in time and cost of transportation.

The Columbia commanded by Captain Gray of Boston was one of the American ships trading along the northwest coast in 1792. At latitude 40° 19′ north, she entered the mouth of a large river, and anchored in a beautiful bay. The river, which was later named the Columbia, was afterwards explored by Vancouver, to whom Captain Gray had spoken of his discovery.

The French in Canada began to dream of a northwest passage to the Pacific as early as 1670, but the first attempt to find an overland route across the continent was made by Captain Jonathan Carver, in 1763, with the sanction of the British Government. He failed to accomplish his purpose; but in 1792 an expedition conducted by Sir Alexander McKenzie succeeded in reaching latitude 52° 20′ 48″. McKenzie at once realized the possibility of linking together the trade on both sides of the continent; and upon his return to Montreal he suggested that to prevent conflicting interests from interfering with the prosecution of this great scheme, the Hudson's Bay Company, claiming much of the territory by charter rights, and the Northwest Company, holding by right of possession, should join issues in the undertaking; but the jealousies of these two companies were too great to permit them to get together.

The Lewis and Clark expedition fitted out in 1804 by the United States Government, succeeded where Carver had failed in 1763. The expedition ascended the Missouri, crossed the Rocky Mountains never before visited by white men and discovered the hitherto unexplored source of the Columbia River, which they followed down to its mouth where Captain Gray had anchored twelve years before.

It was at this time that Mr. Astor conceived the plan "of grasping with his individual hand, the great enterprise, which had been doubtfully contemplated by powerful associations and paternal governments." Where they had feared to venture he pushed boldly forward. He planned to establish a line of fortified trading posts extending from the Great Lakes, along the Ohio. Missouri and Columbia Rivers, with a supply depot at the mouth of the latter from which to furnish supplies to the trading posts of the far west, and to the coasting vessels with which he proposed to trade along the northwest coast. A ship was also to be built to carry supplies from New York to the depot on the Columbia and take the collections of skins from there to China; bringing back on the return voyage, cargoes of oriental merchandise.

To prevent hostile rivalry on the part of the Russian Fur Company this ship was to stop regularly at the stations of that company with supplies; so that the Russian company would no longer be dependent upon transient trading vessels owned by private adventurers, who, actuated only by motives of present gain, supplied the natives with liquor and firearms, making them troublesome and dangerous neighbors for the Russians, and causing the American Government much anxiety lest the acts of these American buccaneer traders should give offense to Russia, at that time the only great power friendly to the New Republic. It will be seen from this that not only was Mr. Astor's project of great commercial importance to himself, but it was also of vital interest to two great nations, to say nothing of its effect upon the colonization of the Northwest.

The Northwest Company looked with unfriendly eyes upon Mr. Astor's scheme. They had already established an advance trading post beyond the Rockies in New Caledonia, as the strip of land discovered by McKenzie between the territory of the United States and Russia was called. They refused an offer of a third interest in his enterprise, and secretly sent out a party under Mr. David Thompson to establish a post at the mouth of the Columbia River before any expedition that might be fitted out by Mr. Astor could reach there. When Mr. Thompson with nine of his party, the rest having deserted before the expedition crossed the mountains, reached the mouth of the Columbia, in July, 1811, he found that the Pacific Fur Company was already in possession.

Some of the retired partners and clerks of the Northwest company however looked with favor upon proposals made to them by Mr. Astor, and on June 23, 1810, joined him in the formation of the Pacific Fur Company. These men were Alexander McKay, who had accompanied Sir Alexander McKenzie on both of his expeditions to the Northwest Coast; and Duncan McDougal, Donald McKenzie, and Robert Stewart, who were also men of large experience in the business of the Northwest Company. In addition to these the partners in the new company were, Mr. William Price Hunt, of Trenton, N. J., who was to act as Mr. Astor's personal representative and manager on the Pacific Coast while Mr. Astor remained in charge of the headquarters of the company in New York, and four other Americans—Ramsey Crooks, Joseph Miller, Robert McLellan, and John Clark. The capital stock of the company was two hundred thousand dollars, divided into one hundred shares, of a par value of two thousand dollars each. Mr. Astor was assigned fifty shares, Mr. Hunt five shares, and the remaining partners four shares each. The balance of the stock being held for division among the clerks at the end of five years, if the enterprise proved successful.

Mr. Astor covenanted to bear all the losses that might be incurred during the first five years, after which the expenses were to be shared by the partners in proportion to their respective interests. As he also furnished all the capital it will be seen that, as in the case of the South West Company, all the financial responsibility was assumed by Mr. Astor, and the controlling power was vested in him. The object of incorporation simply being to give a higher standing to the enterprise, and to bind his associates to him by giving them an interest in any profits that should result from the successful prosecution of his enterprise.

Mr. Astor's plans called for two expeditions to the mouth of the Columbia River; one by water around Cape Horn, and the other overland along the route taken by the Lewis and Clark Expedition, in 1804.

The sea-going expedition sailed from New York, September 8, 1810, on the Tonquin, a bark of 290 tons burden, manned by a crew of twenty-two sailors, and carrying ten guns. The captain was Jonathan Thorn, a lieutenant in the United States Navy, on leave of absence. He was an honest man and capable navigator, but unfortunately his harsh and arbitrary treatment of his passengers was a cause of constant irritation during the long journey. This expedition was in charge of Duncan McDougal, who was accompanied by Alexander McKay, David Stewart and his nephew Robert, partners in the enterprise, and a force of fifty-three clerks, mechanics and canoe-men.

It is interesting to note here that the clerks were bound to service in the company for five years, at the rate of $100.00 a year payable at the expiration of the term of service, and an annual equipment of clothing to the amount of $40.00. In case of misconduct or neglect of duty they were liable to dismissal and the forfeiture of any wages that might be due them; but as on the other hand they were offered promotions and partnerships as a reward for faithful service, it must be admitted that if Mr. Astor is to be charged with having been the originator of the business merger, he must also be given credit for introducing the co-operative system into the business relations of the employer and employee.

The Tonquin rounded Cape Horn in December; and after making stops of some length at Hawaii, and the Sandwich

Islands where fifteen islanders were added to the force of the company, arrived at the mouth of the Columbia River, on March 22, 1811. After spending three days and losing four of the passengers and three of the crew in efforts to sound the channel with small boats, the Tonquin finally crossed the bar on March 25, 1811, and anchored in Bakers Bay, as the estuary formed by the points of land terminating in Cape Adams and Cape Disappointment is called. Some time was spent in exploring the shores of the bay for a suitable site before Mr. McDougal debarked with forty-two of the company, all but four of whom were British subjects, at a point about twelve miles from the mouth of the river. Here a slightly elevated position had been selected where on May 16th, the foundations of Fort Astoria were laid. The Tonquin, with three of the passengers, eight of the islanders, and the sixteen remaining members of her crew, sailed on June 1st, on a trading voyage along the northwest coast. About three weeks later when they were anchored off Woody Point on Vancouver's Island, a large party of Indians who had been exasperated by the insults offered to their chief by the Captain on a previous visit returned, and after some time spent in trading at a given signal suddenly fell upon the ship's company. Taken entirely unawares the crew and the passengers made a desperate resistance, but the Captain, Mr. McKay, and all but five of the party who had escaped to the cabin were quickly killed by the savages. The five in the cabin finally succeeded in clearing the ship by firing through the skylights and companionway. During the night four of them left the vessel in the long boat, hoping to make their way back to the river. The other survivor, who was wounded, refused to accompany them, and the following morning invited the Indians who had gathered on the shore in large numbers to come on board. When the deck was crowded with the natives he fired the magazine and blew up the vessel, killing all who were on it. Three or four days later the men in the boat were driven ashore in a storm, and being captured by the Indians while trying to make their way inland were put to a cruel death. The Indians who committed this outrage were members of the Wake-a-ninishes tribe. When the report of this disaster reached Astoria late in the fall it had a depressing effect on the little company there; and as the months passed by without bringing any tidings of Mr. Hunt and his overland party it was feared that they too had been destroyed.

Mr. Hunt accompanied by Donald McKenzie had reached Montreal in June, 1810. McKenzie who was experienced in the ways of the traders and voyageurs favored securing all the men needed for the expedition before leaving Montreal; but Hunt, who was distrustful of the ever-changing character of the French voyageurs, decided to wait and try to secure the services of American adventurers at Mackinaw and St. Louis, and they left Montreal with only a dozen French voyageurs to man the canoes. At Mackinaw, which at that time was the great outfitting post of the south and was frequented by all the adventurers who operated along the Missouri and Mississippi Rivers, they were joined by Mr. Ramsey Crooks one of the American partners in the enterprise. They were unable to secure suitable men for their purpose here as the place seemed to be a perfect bedlam of dissipation "where men were drinking in the morning, drunk at noon and dead drunk at night." To add to their troubles the agents of the Northwest and Mackinaw companies were doing everything they could in any underhanded way to prevent them from securing recruits. At St. Louis, they encountered the same hidden opposition; and it was the 21st of October before they were able to secure a sufficient number of men of an inferior class to warrant their continuing the journey up the Missouri and on to Fort Nadowa, where they arrived on November 16th, and went into winter quarters. At St. Louis, they had been joined by Mr. James Miller, who like Mr. Crooks had formerly traded along the Missouri; and at Fort Nadowa, Mr. Robert McLellan, the last of the partners to join the expedition, met them. The start from Fort Nadowa for the long journey to the coast was made on April 22, 1811. On September 14th they crossed the divide, and commenced the descent of the western slope. At Pilot Knob or Fort Henry, near the source of the Snake or Lewis River, the great southern branch of the Columbia, they left their horses; and without any conception of the difficulties before them embarked in fifteen frail canoes, hastily constructed, expecting to complete their journey by following the river. After proceeding three hundred and fifty miles they became convinced of the impracticability of navigating the dangerous waters of the torrential mountain stream and gave up the attempt.

Considerable time was spent in exploration, and in vain efforts to fall in with friendly Indians from whom they might obtain new supplies of food, before they finally decided to divide into four bands, each of which, under command of one of the partners, was to make its way independently to the mouth of the Columbia. The parties under McLellan and McKenzie followed the right bank of the river, and those under Hunt and Crooks continued along the left bank.

McKenzie's party suffered many hardships; and after they entered the narrow and rugged defiles of the Blue Mountain were at one time without food for five days before they caught a beaver on whose flesh they subsisted three days; but at length they reached the main waters of the Columbia and finally on January 10, 1812, McKenzie, McLellan and Reed, gaunt and haggard, with eight others, some of them scarcely able to drag themselves along, reached Astoria. The thirty-four people with Mr. Hunt had an easier time, but as they spent some days resting with friendly Indians they did not reach the station until February 15, having made the latter part of the journey in canoes.

Crooks and Day, who with four Canadians had lost Hunt's trail at the Grande Ronde and remained in that vicinity during the winter, arrived alone on May 10, 1812. Three of the Canadians had abandoned them in February preferring to remain with the Indians rather than to continue the journey, and the other Canadian was left with a band of Shoshone Indians because he was unable to travel further. Seven other members of the party who had been detached at various points along the route reached Astoria nearly a year later, on January 15, 1813. The party with Mr. Hunt therefore consumed 340 days in making the trip from St. Louis to Astoria; 140 days being spent in camp at various points along the route. Mr. Hunt's estimate of the distance covered was 3500 miles. The most direct railroad route at the present time makes the distance 2300 miles.

There has always been a disposition to criticize Mr. Astor for entrusting so much of the management of this enterprise to English and Scotch partners. He claimed that as Oregon at that time was disputed territory, it was the part of wisdom to disarm the suspicions of the British Government, and keep them from active interference with his plans, by letting it be known that his company was largely made up of British subjects. From a careful consideration of all the facts it appears however as if the chances for success would have been better if the positions of responsibility had been held by men who were not so closely connected with those in control of the Northwest Company; for when David Thompson appeared at Astoria on July 15, 1811, with a party from Spokane, he was received with great cordiality by Mr. McDougal who in the absence of Mr. Hunt was in charge of the station, although there was a suspicion on the part of the Americans in the settlement that Thompson had only come to spy upon them in the interests of the Northwest Company, and to discourage them with tales of the dangers and hardships before them if they remained at the station. During the weary months when the little company were trying to maintain their position at Astoria there were other instances of disloyalty to the new organization on the part of some of the former members of the Northwest Company, and it was McDougal again who made the agreement with John Laroche and John George McTavish in October, 1813, under which a month later all the furs and merchandise in the country belonging to Mr. Astor were conveyed to the Northwest Company for about one-third of their actual value. There has been some controversy as to whether McDougal was acting in good faith when he entered into this contract, and it is a significant fact that within a few months after this deal was made he was given a lucrative position by the Northwest Company.

As Captain Chittenden in his "History of the American Fur Trade," says: "It is no flight of fancy, but rather a sober and legitimate conclusion, to say that if the Astorian enterprise had succeeded the course of Empire on the American continent would have been entirely different from what it has been. With the valley of the Columbia and the neighboring shores of the Pacific occupied by American citizens instead of British subjects during the period of controversy over the Oregon question, no part of the Pacific coast line would now belong to Great Britain."

Washington Irving in his "Astoria" enters fully into the details of the struggle of the Pacific Fur Company to hold the advantages it had gained on the Pacific Coast; but it is sufficient for our purpose to note the circumstances of its organization and failure; and it only remains for us to say that on December 12th, 1813, Captain Black of the British sloop-of-war Raccoon raised the British standard over the fort, and took possession of the establishment and the country in the name of his sovereign, changing the name of Astoria to Fort George.

From that time the Northwest Company reigned supreme west of the Rocky Mountains until 1821, when it was absorbed by the Hudson's Bay Company, which thus became the representative of all previous fur companies, and after entering into an agreement with Russia for the lease of Alaska, in 1839, established trading posts from the Bering Sea to San Francisco; remaining in full and undisturbed possession of the fur trade of the Northwest until it was obliged to relinquish its exclusive rights by the treaty of 1846. It was not until 1860, however that the Hudson's Bay Company finally abandoned its various establishments in Oregon and Washington, and transferred all its movable property not disposed of to Fort Victoria on Vancouver Island.

In 1863, the old shareholders, alive to the signs of the times, allowed themselves to be persuaded to sell out to a "New Company of Proprietors," who later sold their rights —real and imaginery—to the Dominion of Canada, for three hundred thousand pounds. Since that time, though they still continue to exist as a powerful merchant company exerting a dominating influence on the fur trade, the Hudson's Bay Company have been "lords of the soil" only over an area of a mile around each one of their forts; and even the district of which Edmonton is the center and in which for many years they held exclusive trading privileges is "open country," where other large firms have established trading posts or agencies, and where individual collectors travel from point to point purchasing the catch of trappers who do not come to the posts. Every year the number of skins passing directly from the hands of the collectors into those of the manufacturers and skin dealers is increasing, but the final values are still, to a large degree, determined by the prices obtained at the Fur-Marts, or fairs, held at stated times in various parts of Europe, and which form the subject of another chapter.

"The organization of the Hudson's Bay and Northwest companies, their internal regulations, method of dealing with the Indians, and policy in preserving the fur-bearing animals from extinction, were the outgrowth of long experience, and embodied the highest wisdom in the management of their extensive affairs. The experience of each of the rivals was added to that of the other in the amalgamated company after 1821, and formed one of the most perfect commercial organizations of which the world has any knowledge. The systems of service and promotion protected the company from incompetent servants. To gain high position in the service one must begin at the bottom and work up. All must work for the company's interest, and none were allowed to engage in any private trade. Employes were frequently changed in station to break up any irregular practices which might grow up with long residence in one place, and this rotation was taken advantage of to reward faithful service and punish the reverse. The company's officers had power to try and punish offenders. Military duty was exacted whenever necessary, and a regular uniform was provided. The whole organization, from the governor down through factors, traders and clerks, to the lowest local manager, was based upon the principle of perfect discipline, absolute subordination of individual interest to that of the company, and a regular promotion based upon merit. Long experience had perfected all parts of this intricate machine, and not even the greatest of modern railway systems can excel it in thoroughness of detail and organization."

"In its dealings with the Indians the same wise policy was apparent. Where not necessary to meet competition the sale of liquor to the natives was not generally indulged in. All trade was upon a fixed, though just, basis, and the Indians knew exactly what to expect. The traders were men of experience with the natives, and were well acquainted with the Indian character. Intermarriage with native women was common from the chief officers down to the ranks, and thus bonds of mutual interest were created. Although this company did not always escape difficulties with the Indians, it was generally on terms of peace with them, and its hold upon them as against irregular traders was well-nigh absolute. It may readily be seen how powerless must have been a private trader and even a strong company against this embodiment of power, wealth and organization."

We have only outlined the operations of some of the most important companies of fur traders; for the story of the Hudson's Bay Company alone would fill many volumes, if told in detail from the date of its romantic formation down to the present day when it is devoting much of its time and resources to the more prosaic work of opening up a chain of mammoth department stores in Galgary, Edmonton, Victoria, and other growing commercial centers in British Columbia. As George Bryce says: "For full two centuries the Hudson's Bay Company, under its original charter, undertook financial enterprises of the greatest magnitude, promoted exploration and discovery, at one time held governing powers over an empire comprising nearly one-half of North America, and preserved to the British Empire the wide territory handed over to Canada in 1870; and for more than two generations since that time, it has carried on a successful trade in competition with many rivals, and still shows all the vigor of youth. Whatever ground there may be for criticism of some of the earlier methods of this great organization, the wonder is that with the extensive powers it has enjoyed, it should bear after its long career, over such an extended area of operations, and under so many different conditions, so honorable a record."

The Hudson's Bay Company has it is true always been a keen trader, as its motto "Pro Pelle Cutem"—skin for skin—implies; but with this surely no fault can be found. One of the greatest testimonials in its favor is that when after two centuries it voluntarily gave up except as a purely trading company its power in Canada, its influence over the widespread Indian population of Rupertsland was so great that it was asked by the Canadian government to retain one-twentieth of the land of that wide domain, as a guarantee of its assistance in transferring power from the old to the new regime. What better proof can we ask that on the whole those in control of the operations of the Hudson's Bay Company have borne their honors meekly, and exercised their great power for the good of the people in general as well as for the best interests of the company they served.

That John Jacob Astor, in organizing The South West Company, and the Pacific Fur Company, was also animated by a higher motive than the mere promptings of a personal ambition, is evidenced by the following extract from a letter written to his partner, Mr. Hunt, at the time when the treachery of associates, the chances of war, and the machinations of the Northwest Company were threatening disaster to his enterprise on the Pacific coast. He says: "Were I on the spot I should defy them all; but as it is everything depends on you and the friends about you. Our enterprise is grand and deserves success, and I hope in God it will meet it. If my object was merely gain of money I should say, save what you can and abandon the place; but under the conditions the very idea is a dagger to my heart." If anything further is needed, to prove that he thought at least as much of the effect that the failure of his plans would have upon other interests, public and private, as of any personal loss it would bring to him, it is furnished in the words with which he received the news of the sale of his Pacific coast properties to the Northwest Company by McDougal, "I had rather lost all by capture while trying to defend the fort."

No one who has carefully read the history of the development of the fur trade as it is related by Washington Irving, George Bryce and Captain Chittenden, will question the statement—that the men who formed, and controlled the policies of the companies who laid the foundations of this great commercial enterprise, were not only captains of industry, but empire builders of the highest order. No better illustration of this can be found than the following brief sketch of Lord Strathcona's life, and his connection with the Hudson's Bay Company.

Rt. Hon. Sir Donald Alexander Smith, Lord Strathcona and Mount Royal, was born at Torres, Moryshire, in the north of Scotland, August 6th, 1821. He was given a good English and classical education, and in 1838 entered the service of the Hudson's Bay Company. He was first sent to Mingen, Labrador, a desolate region, where he remained thirteen years before he was given a post in the great Northwest in whose history and development he took such an important part. During his stay on the Labrador coast he was attacked with color blindness, and apprehensive of losing his sight decided to go to Montreal to consult a good oculist. The journey at that time was a perilous one, but accompanied by two half-breed guides he finally reached his destination. When he presented himself at the headquarters of the company he was censured for leaving his post without authority, and commanded to return without delay. Discouraged and disgusted at the reception given him he was on the point of throwing up his position, but upon consideration wisely decided to return to Mingen and remain in the company's service. His trip to Montreal, however proved a benefit in the end, as it helped to show those in authority the kind of material he was made of, and he was promoted step by step until he became a chief factor. Later he was named resident Governor and Chief Commissioner of the Company in Canada, a position which he held until 1870, when he presided at the last meeting of the Council of Officers held at Norway House before the reorganization of the Company. Subsequently he was appointed Governor of the Board in London; and in 1886 he was created a Knight Commander of the orders of St. Michael and St. George for his services to the government in Red River rebellion in 1869 and on other occasions.

"The officers who had charge of the various districts in the Northwest annually met in a Council for the regulation of the affairs of business for the ensuing year. Looking upon themselves as partners of the Company, they felt that they were entitled to participate with the shareholders in any amount which might be received for the cession of the territorial rights of the Company. When therefore the Company had come to an agreement with the Colonial Office for a transfer to the Canadian Government of its territorial rights upon the payment of three hundred thousand pounds, the officers of the company felt that they should receive a share of that amount. In 1870 the Council of Officers already referred to was held at Norway House on Lake Winnipeg and it was decided to present the claims of the officers to the Company in England. With this object Mr. Smith, who as Governor at Fort Garry was present at the Council, was unanimously appointed as representative of the officers, and undertook the task of presenting their claims. The result of his mission was that compensation was given to the officers for the relinquishment of their claims, the sum of one hundred and seven thousand pounds being divided amongst them, and a new agreement, called the Deed Poll of 1871, was entered into.

"The officers felt that to the judgment and discretion of Mr. Donald A. Smith was due the just recognition of their claims, and when he returned in the following year they presented him with a valuable testimonial of their esteem. Mr. Smith was appointed Chief Commissioner of the Company under the new Deed Poll and assumed control of affairs at Winnipeg. In 1874, Mr. Smith owing to his parliamentary and other duties gave up the position of Chief Commissioner, so far as the control of trade matters was concerned. In this position he was succeeded by Mr. James A. Grahame, although he still retained the management and control of the Company's land affairs and continued to take the deepest interest in its welfare.

"The affairs of the Company continued with varying success and in accordance with the condition of the times, but with no occurrence of public importance, until in 1879, Mr. Donald A. Smith resigned his official connection with the Company. The committee in accepting his resignation, referred to the many important arrangements in which he had taken a part, and expressed their gratitude for the fidelity which he had displayed to the general interests of all concerned."

Mr. Smith had served his country as faithfully as the company he represented, and after he retired from business life devoted all his time and energies to the public service, holding high administrative positions in Canada and being consulted by the Home Office on all important questions relating to that territory. He well merited the honors and titles later bestowed upon him by his Sovereign.

The Missouri Fur Company was the first to operate from St. Louis westward. It had nearly run its course before either of its principal competitors was well established. Like that of many other great institutions, the history of this company is practically the history of one man—Manuel Lisa, who was born at New Orleans, September 8, 1772. About the year 1800, he secured from the Spanish government the exclusive right to trade with the Osage Indians. In 1808 he was the leading spirit in the organization of the St. Louis Missouri Fur Company, and became still more prominent in its management after its reorganization in 1811. The other members of the company were: Benjamin Wilkinson, Pierre Chouteau, Sr., Auguste Chouteau, Jr., Reuben Lewis, William Clark, Sylvester Labadie, all of St. Louis; Pierre Menard and William Morrison, of Kaskaskia, Illinois; Andrew Henry, of Louisiana, and Dennis FitzHugh, of Louisville, Kentucky. The company included some of the best traders in the west, but owing to a series of unfortunate circumstances beyond their control the expectations of its founders were never fully realized. Another reorganization took place in 1819 and, with the exception of Manuel Lisa, not one of the names of the founders of the old company appeared on the new charter; which shows that the members were: Manuel Lisa, president; Thomas Hempstead, Joshua Pilcher, Joseph Perkins, Andrew Woods, Moses Carson, John B. Zenoni, Andrew Drips, and Robert Jones. The company continued in existence until about 1830, when its affairs were finally wound up.

The great mistake of the Missouri Fur Company was their unwillingness to permit Mr. Astor to have any share in the business, as he was probably the only man who could have carried them through their initial misfortunes to ultimate success.

Mention has been made of the incorporation of the American Fur Company by Mr. Astor, April 6, 1808. As was then stated Mr. Astor was the company, and the incorporation was merely a fiction to broaden and facilitate his operations.

When Congress by its action suspended the operations of the South West Company, and the Pacific coast enterprise also ended in failure; Mr. Astor soon regained the ground he had lost, by taking advantage of the Act of April 29, 1816, by which the Northwest Company, as well as the South West Company, was compelled to relinquish its interests on American territory. He secured control of the American business of both of these companies by establishing a new coast to coast connection through the operations of the Pacific Fur Company, and the western department of the American Fur Company at St. Louis, which at that time was the starting point for all expeditions to the far west, and the transfer point for freight shipped into the remote regions from the east, as well as the merchandise and skins sent from the Pacific slope, the Great Lakes, and the mountain country to the eastern market.

Among the articles of trade that were exchanged for the furs of the Indians liquor was at all times by far the most important. It is impossible to exaggerate its importance at that time, and it is only by understanding the conditions of the business that one can account for the almost frantic appeals that were continually pouring into the office of the American Fur Company at St. Louis for more liquor. "Liquor we must have, or we might as well give up" is a sample of the complaints that burdened the correspondence of the traders. Chittenden says, "It was impossible to conduct the trade without it if one's opponent was provided with it, the only alternative being to retire from the field.

"The Act of July 9, 1832, prohibiting absolutely the introduction of liquor into the Indian country, was therefore simply appalling to Mr. McKenzie, who was in charge of the company's trading interests. He had no confidence that the small traders would be held to the law by the inspectors, and he knew that if they were, they would smuggle liquor by them. He had learned from experience that the great commerce of the American Fur Company made such clandestine work impossible, especially as they were operating in the enemy's country where there was a spy at every turn. McKenzie's first move was to go to Washington and New York and see if he could not affect some modification of the regulation for enforcing the liquor law. He was entirely unsuccessful in his mission, and returned to St. Louis with gloomy forebodings for the future. There was no course now open, apart from extensive smuggling which was an extremely perilous business for the company at that time, except to carry out an ingenious and radical measure which for some time had been developing in McKenzie's mind. This was nothing less than to open up a distillery at Fort William and commence the manufacture of liquor on his own account. He would be within the law he reasoned, because that forbade only the importation of liquor into the Indian country. To such feeble subterfuges did the exigencies of the fur trade drive men of real and unquestioned ability. The house in St. Louis took legal advice in the matter and astonishing as it may seem succeeded in getting an opinion in favor of the project; and in 1833, in spite of strong opposition on the part of some of the members of the company, the distillery was set up and put in operation at Fort William.

"There is abundant evidence that the experiment was a complete success. McKenzie was greatly elated over the results for it placed him on a footing of independence and unquestioned superiority over his rivals. In writing to Crooks he said: 'I have a good corn mill, a respectable distillery, and can produce as fine liquor as need be drunk. I believe no law of the United States is broken by us, though perhaps one may be made to break up my distillery; but liquor I must have or quit any pretension to trade in these parts.' But alas, at the very moment that McKenzie was writing his exultant letter to his chief in St. Louis the latter was agitated with very different emotions, for he had but lately experienced in a forcible way the proof of the adage that 'The way of the transgressor is hard.'

"The distillery business had been reported to the United States government and mischief was to pay. The government authorities were highly incensed at this obvious contempt of law. The company had a life and death struggle and it was only by a dangerously narrow margin that it saved its life."

Mr. Astor retired from the American Fur Company on the first of June, 1834, when the Northern Department retaining the name of the American Fur Company, was sold to a company of which Ramsey Crooks was the principal partner, and the Western Department to Pratt, Chouteau & Co., of St. Louis.

FUR FARMING.

Fur Farming is only in its infancy, but the success which has rewarded the efforts of those who have faithfully and intelligently labored to rear foxes, skunks, minks and other species of fur-bearing animals in captivity, demonstrates the possibilities of the industry when properly conducted under right conditions. Fur Farming has little to offer to those who engage in it as a "get rich quick" scheme, but for the man who is willing to accept a reasonable compensation for his time and the money invested in the enterprise while working for the full development of his plans, it promises larger returns than any other business in which he could engage with the same amount of capital.

The Hon. Charles Dalton, after twenty years of successful operation, sold his fox ranch on Prince Edward Island for six hundred thousand dollars, and Mr. Tuplin received two hundred and fifty thousand dollars for his farm; but these men made a study of the animals they were raising and conducted their operations along scientific lines, at all times giving the best that was in them to the work in hand, and looking to the future rather than to the immediate present for results. What they succeeded in doing with foxes, and others have accomplished with skunks, can also be done with minks, raccoons, opossums, muskrats, and possibly bears and lynxes, although it does not appear probable that martens, fishers, weasels, wild cats or wolves can be profitably domesticated.

The Fur Farmer will find that unless the animals have plenty of runway they will not fur properly. If they are kept in restricted quarters, or penned up in a small enclosure, the pelt or hide will be thick and the fur thin; the reason for the thick, silky, glossy fur on skins that come from some of the ranches is that the animals have plenty of room and an abundant varied diet; skunks for instance that are fed principally on meat, to the exclusion of vegetables and fruit, will not present as fine an appearance as those that are raised on a mixed diet. The thing to strive for is to duplicate as far as possible the natural conditions under which the animal is at its best. It is impossible to improve on nature.

Another thing to be considered is the natural nervousness of wild animals when placed in restraint, and subjected to unusual sights and surroundings; great care should be taken to avoid anything that might startle them or cause them to take alarm. The young at least if properly protected will soon become tame, and instead of worrying the fat off their bodies, and the hairs off their hides, will grow sleek, and develop a fine pelage.

When the killing time comes care should be taken not to frighten the animals that are to be kept for breeding purposes. The animals to be slaughtered should be driven into a separate enclosure and out of sight of the others before being killed.

FOX RAISING.

Benjamin L. Raynor of Alberton, P. E. I., Canada, and J. Walter Jones of Washington, D. C., have made a careful study of the fox-breeding industry on Prince Edward Island. The report of their investigations first appeared in the "American Breeders Magazine." It was republished by the "Fur Trade Review" in November, 1912, and is the source of much of the information this chapter contains relative to "fox farming" in the Dominion of Canada.

Foxes that have been kept as pets and in zoological gardens have never been known to rear their young. The reason for this seems to be the extreme nervousness of the females, who have been known to go about for days with their young in their mouths, putting them first in one place and then carrying them to another, until finally the pups have died from the effects of exposure and handling. Keepers often watch by the pens day and night for weeks at a time, to prevent the mothers from injuring themselves or their young. The females are so wild during the breeding season that the ranchers make it a rule to close the ranches in January, and allow no one but the keepers to go near the pens between that time and June when the young are out and playing about. It is stated that during the period that the pups are with the mother the keepers always wear the same clothes, lest a change in their appearance should worry the sensitive animals.

The behavior of a mother fox on a ranch in Ontario, is referred to as illustrating how little it takes at certain times to cause trouble. The ranch owner whose home could be plainly seen from the pen, made a contract to have his house painted. When the painters started to work, the sight of a stranger or the smell of the paint so excited the mother fox that she brought out her young and killed them.

In their wild state the males are monogamous and forage for their young. On the ranches, where all the food is provided, there is danger of two parents killing the pups by over attention, so the males are separated from the rest of the family in March, and kept apart until the young are able to take care of themselves. The period of gestation is exactly fifty-one days. The young arrive in March, April or early May. Litters of from one to as many as eight have been recorded, but the average is about four pups. The price of one thousand dollars was refused for a female fox that had reared eighteen young in three years. Foxes mature for fur or breeding in eight months and they are fertile for nine or ten years. The custom appears to be growing among breeders to mate one male with two or more agreeable females. It is plain that by this method a selection of sire can be made, and quicker improvement in quality achieved.

During the productive period of about nine years, the average production of a pair of foxes will be about thirty young. If these are of the best stock the pelts will be worth $1,500 each at the present market prices, so the yearly profits from a pair should be about $5,000. Every joint stock company that is formed and hires a manager cannot however expect to procure such results. Efficient managers are very hard to find and the best management will not prevent occasional escapes and thefts. The industry is best prosecuted on a diversified farm where waste food material, quiet, and the personal interest of the owners, will go farther toward assuring success than any skilled management that capital can purchase. The business can be very profitably prosecuted by neighbors who will unite in the feeding, care and protection of the stock from thieves, and in the hunting and trapping of escaped animals.

In any well settled country there is always enough cheap food to provide for hundreds of foxes. A healthy old horse or cow; livers, heads, feet and other refuse; calves, fish, bread, milk, eggs, rabbits, and even poultry, make the best kind of Fox food. A nursing mother Fox should get plenty of eggs, milk and porridge. On the average, in a province like Prince Edward Island settled with fifty people to the square mile it costs from two to three cents per day to feed a Fox. Some of the ranches have great numbers of rabbits inside the outer fence, which gives the Foxes a chance for an occasional chase and an opportunity to secure familiar food in the natural way.

Soil, climate and location must always be considered when choosing a farm for breeding purposes. A limestone or alkaline soil will decrease the value of the fur by making it harsh and brittle. A cold climate is a prime necessity for the production of high class fur, and the Fox pens must be secluded from the intrusion or even observation of strange men and animals. A forest covering, preferably of spruce, fir, pine or cedar, is very desirable.

A farmer while hunting some straying cows in the woods in 1888, found a male and a female Silver Fox pup in the hollow of a log. He carried them home and traded them to a neighbor for a cow and a few extra dollars. The neighbor experimented for several years with various kinds of pens and treatment, but finally becoming discouraged sold the Foxes to another neighbor for eighty dollars. This party was no more successful than the previous owner, and soon sold the Foxes to a ranch owner who lived on an island in Cascumpec Bay. The quiet of the new place, the increasing tameness of the Foxes, and the new owner's knowledge of the requirements, produced conditions that relieved the nervous mother's apprehension for the safety of her young, and three pups were reared to maturity in three seasons. This success, although the result of eight years of experimentation, caused six men who thoroughly understood the science of rearing Foxes in captivity to engage in the industry of raising Foxes for breeding purposes, but they jealously and successfully guarded their secret until 1910. Up to that time, with the exception of some light Silvers sent to distant places, no live Foxes had been sold by them. The surplus stock was always killed and the pelts marketed in London. A dark silver pelt sold in 1901 brought £580 ($2,718) at a London auction and in 1910 the prices of

£540 and £480 were received for two skins, these being the highest prices ever paid for Silver Fox skins.

At the present time there are about eighty ranches on Prince Edward Island, stocked with about two hundred fine dark Silver Foxes, about three hundred Silver Greys, and something like four hundred very light Silver, Crossed and Red Foxes. The total skin value of these animals is about five hundred and fifty thousand dollars, and for breeding stock they are worth at least three times that amount; but it is safe to say that the industry could not be purchased outright for three million dollars today.

The ranchers who obtain the best results have only descendents of the stock originally caught on Prince Edward Island. All the high priced pelts that have been referred to were from Foxes of this strain. If an ordinary Red Fox of Prince Edward Island is bred to a black, and the resulting young are bred to a black for four or five generations, a good Silver Fox will result. The first cross produces what is designated a "Cross" or "Patched" Fox, the next mating produces a cross of a better quality with hardly any reddish tinge in the hair, and with silver patches on the back. The third mating will produce a light Silver Fox worth probably five hundred dollars, and the result of the fourth mating will be a Dark Silver worth upwards of one thousand dollars. Many farmers of small means thus breed up their stock by the use of only one high priced animal.

Where indiscriminate crossing of the colors takes place under natural conditions Foxes occur in about the following proportion, and pelts bring the trapper or breeder approximately the prices named: One hundred thousand Red Foxes valued at five dollars each; ten thousand Cross Foxes valued at fifteen dollars each; one thousand light Silver Foxes valued at two hundred dollars each, one hundred dark Silver Foxes valued at a thousand dollars each. It will be seen that the price is in inverse ratio to the number produced. Scarcity may influence the present price of dark Silver Foxes, but there is no question of the great intrinsic value of their pelts. They are marvels of richness and beauty, and even if produced in as great numbers as the red ones would still be many times their value. The price of dark Silver Foxes has always been high, and always will be because that fur will be as popular with royalty in the future as it has been in the past, and the existing demand will be increased rather than diminished. The enormous decrease in many costly furs, and the vastly increased number of people demanding them, have brought about a situation very encouraging for the domestication of many animals, because of the great profits to be derived from the industry.

There can be no question as to the possibilities of "fur farming" when carried on by competent individuals. The reports show that the Silver Fox industry will bring to the ranchers on Prince Edward Island over six million dollars in 1913, and that orders have been placed there for a large number of pairs of a particular breed at an average price of ten thousand dollars per pair. In addition to the hundreds of private partnerships with an aggregate capital of one million five hundred thousand dollars, there are over fifty registered companies with a total investment of upwards of four million and a half; everyone of any importance on the island seems to be interested in this enterprise which is developing more millionaires to the square mile on Prince Edward Island than are to be found in any province in Canada.

The pioneer "Fox Farmer" on the island was Hon. Chas. Dalton, a farmer of Irish descent, who after many experiments and as many failures finally succeeded with the help of his partner Mr. R. T. Oulton in raising near Alberton the first breed of Foxes reared in captivity. This was twenty years ago, and as before stated up to 1910 the business was confined to the owners of the Dalton-Oulton ranch, Mr. Robert Tuplin, Mr. Frank Tuplin, Mr. Harry Lewis and a few others who were in the secret; and even now all the stock used on the many farms being operated on the island comes from the Dalton and Oulton original breed.

The Russian Government and the New Zealand authorities gave an impetus to the industry when they sent experts to investigate, and upon their report invested one hundred thousand dollars in young stock. Since that time existing ranches have had more orders than they can fill, even at a price of twelve thousand five hundred dollars for a pair of Silver Black Foxes.

There need be no doubt as to the permanency of the "fur farming" industry, for when the demand for one species slackens there will be an increased market for other animals; and there will always be a profitable sale for valuable skins, even when there is no call for animals themselves for breeding purposes.

If an animal as sensitive as the Fox can be successfully reared in captivity, it is safe to assume that any species of wild life can be propagated on fur farms established under proper conditions.

The Russian Sable is nearly as valuable as the dark Silver Fox, coats of this fur often costing as high as twenty-five or thirty thousand dollars and upward. The writer years ago sold two Black Fox skins for forty-five hundred dollars, and a set of natural Black Fox fur worn at the last New York Horse Show is said to have cost the owner sixteen thousand dollars, although only four skins were used in its manufacture. The writers referred to at the beginning of this article justly claim that unless immediate steps are taken to increase the number of Foxes, Siberian and other Martens, Otter, Beaver and Mink and some of the other valuable fur-bearing animals which are capable of being domesticated, none but the very rich will be able to buy furs. The fact that the Silver Fox has been successfully domesticated by the efforts of a few men without any encouragement of the government, and with no financial backing except meager incomes from farming and trapping, should inspire extensive governmental experiments, to determine the feasibility of extending the number of domesticated fur producing animals. With an estimated yearly expenditure of from two to three hundred million dollars for the skins of American reared animals alone, "why are the woods being depleted of our handsome wild animals by such a cruel method as trapping? Why are not the trappers converted into animal husbandman?"

A Fox ranch may be from half an acre to five acres in extent, and should be enclosed with a stockade fence ten feet high with an inner wire fence of the same height, and so constructed that the Foxes cannot escape by burrowing underneath or climbing over the top. The kennels on the inside—one for each pair—should be large and roomy, and contain dens where the Foxes can sleep and make their nests.

Originally the cost of maintaining a pair of Foxes on Prince Edward Island did not exceed seven dollars a year, but with the growth of the industry the price of food stuffs has advanced, so that the cost now is about twenty-five dollars per annum.

SKUNK RAISING.

The Skunk has received more consideration from fur farmers than any other animal, and where proper care and judgment have been exercised skunk raising has always proved a profitable investment for the time and money devoted to it. The few failures that have resulted have been among the larger operators, whose knowledge of the nature and habits of the animal, and the requirements of the industry, were theoretical rather than experimental. The people who have started in on a small scale were for the most part either trappers or others who had enjoyed opportunities to study the animals and their wants, and were in a position to give to the venture that personal and comprehensive attention upon which the success of every enterprise depends. This does not mean that those without practical experience with the animals must necessarily make a failure of fur farming. The point we wish to emphasize is, that the successful breeders of fur bearing animals are those who make a special study of the species they are propagating, and who take the same interest in them that they would in any strain of domestic cattle they were trying to develope. The men who fail in fur farming are those who neglect to study the habits of the animals, and consequently know nothing about caring for them when in captivity. In Silver Fox farming, where a pair of breeding Foxes cost from six to twelve thousand dollars, capital as well as knowledge is required to begin business unless the breeder is in position to capture his own stock; but in Skunk-raising, where a man can start with a half dozen males and a couple of dozen females at an expense of a few hundred dollars, the only essential element of success is knowledge and faithful work.

Skunks breed well in captivity and will eat almost any kind of food from carrion down to mice and insects; they are also partial to corn, sweet potatoes, melons and fruit. In captivity they should be fed at regular intervals, and given as far as possible a mixed diet—part animal and part vegetable. Bread and milk should be fed them occasionally, and if the farm is near a slaughter house the offal can be made to take the place of carrion. As it is lack of food that causes the older animals to eat their young, breeders should see to it that they have plenty of the right kind of food during the spring and summer seasons, and thus prevent one of the great causes of loss.

Skunks mate in February or early in March, the period of gestation is about nine weeks, and the young are usually produced in May, though occasionally some are born in April. The number of young to a litter is from four to ten, and sometimes even more. The interior of the enclosure should be so constructed that there will be separate compartments for the males, and the females and their young, the larger space being given to the latter. Some breeders have small yards to accommodate two or three families after the young are born, but this is not necessary, the main object being to keep the males apart from the rest of the family until the young are able to take care of themselves. Of course when the number of animals increases, it is advisable to have separate breeding yards large enough for say a dozen females.

Great care should be exercised in the selection of males for breeding purposes. Only large healthy animals of good color should be used, the rest of the males being killed and their skins marketed. One male Skunk will serve ten females, and should be left in their company several days. To make sure of results another male should be installed for a few days after the first has been removed, but two males should never be allowed with a party of females at the same time or a fight will ensue. Fresh breeding stock should be secured each year from other localities, as the results will be disastrous if related animals are allowed to inbreed for a few years. The animals do not always breed strictly to color, but the white markings can be reduced and the stock improved by selected breeding. A full black mated with a long stripe should produce shorter stripe animals, and these if mated with full blacks should give still better results. The color of Skunks can be bred up as well as that of the Foxes. The best animals should always be kept for breeding purposes. The fur farmer who kills off his finest specimens to compete for the prizes offered for the finest skins makes a fatal mistake. It is the man who always breeds up to the best who has the finest average skins to market.

As Skunks are found in all parts of the United States, Skunk farms can be operated successfully anywhere that the climate is cold enough in winter to cause the growth of thick soft fur, but up to the present time this industry has been largely confined to Ohio and Pennsylvania. A. R. Harding in his book on Fur Farming, in writing about enclosures, says:

"There should be a spring on, or a small stream crossing the ground to be inclosed, but at the same time the ground must not be wet; in fact, it should be of rather dry nature so that there will not be too much dampness in the dens. There should be banks of earth for the animals to den in, and the ground should have a gradual slope so that it will drain readily. If it is of a sandy nature it will be all the better. Some who have tried Skunk farming have located the yards on the shore of a small lake or pond and have included a portion of the pond in the enclosure. This is a good idea and it will not be necessary to extend the fence very deep into the water, as the Skunk is not a water animal and will not dive under; where the fence crosses a stream of running water however the fence should reach to the bed of the stream as the water will fall considerably during dry weather."

"The enclosures should be large. When the animals are enclosed in small yards or pens they become infested with fleas, ticks, etc., and they do not thrive. Small enclosures will answer for a short time, but as soon as possible the Skunks should be placed in a large roomy yard. For fencing material galvanized wire netting of one-inch mesh is advised, as the young animals will escape through a two-inch mesh. The fence should be seven feet in height. Under ordinary conditions the Skunk will not escape over a four-foot fence, but there is danger in winter from drifting snow, and dogs and other animals must be kept out at all times, and therefore the fence should be of a height mentioned and it must be turned in at the top or a sheet of tin placed along the edge to prevent the animals from climbing out."

"In each compartment a number of dens should be made by digging a trench and covering afterwards. While the animals will dig dens if necessary, they prefer, even while in a wild state, to use dens already made. Boxes, barrels or pens with board floors should not be used. Some of the successful breeders claim that this has a tendency to cause a thick pelt and thin fur and say that it is absolutely necessary that they have natural dens in the ground. The dens should be made quite deep so that there will be no danger from frost in winter."

MINK RAISING.

It is hardly possible to tame the adult wild Mink, but the young submit to handling and can be easily domesticated. Mr. Boughton says that the time to secure them is in May or June when they begin to run with their dams and can easily be tracked to their nests and dug out or taken as they leave the hole. Owners of Mink breeding stock ask very high prices, but in this way a start can be made in Mink raising at a trifling expense.

Minks are by nature solitary, wandering animals, and it is impossible to rear them successfully in captivity if large numbers are kept together, so their enclosure should be a large one, and so arranged that the male and female can be together frequently from the middle of February to the middle of March, but kept separate at all other times.

The season for mating is the first two weeks in March, and the young are born six weeks later, four to six to the litter. The young are blind five or six weeks, and are weaned when from eight to ten weeks old. When four weeks old the mother begins to feed them meat and continues to supply them with food until they are about four months old. The young soon separate when left to shift for themselves and do not pair, the male being a rover. Minks are very cleanly, and as soon as the nest is foul the mother moves the young to another nest.

Minks are strictly carnivorous animals and always prefer fresh food, and therefore are not so easy to supply with food as the Skunk or Muskrat; but as they are fond of fish feeding will be comparatively easy if the enclosure is near a place where fish can be obtained.

When the animals become tame enough, dens should be provided for them similar to those used in their wild state; these can be made by burying tile in the ground, or by making other artificial burrows. A few hollow logs placed in the enclosure will be enjoyed by the animals.

If properly watered and fed, and given houses like those they were accustomed to in their natural state, there need be no fear that Minks will not fur properly in captivity; but as in the case of stock, and all species of fur-bearing animals, it will not be the man who goes into Mink raising only to secure a fortune who will obtain the best results, but the breeder who loves the animals and studies their needs and provides for their comfort.

Space will not permit us to describe as fully as we wish some of the Mink enclosures the writer has seen, but in the near future he hopes to publish a comprehensive volume upon the subject of fur-farming which will deal fully with this interesting subject.

THE FURRIERS.

At the present time the dividing lines between the different branches of the industry are not drawn as closely as in the early days. Even the Hudson's Bay Company has stores for the sale of manufactured furs, and some of the large manufacturers have their own trading posts and supply stations in the remote regions and are Skin Dealers as well as Furriers.

Fifty years ago, the business of selling manufactured furs in America was entirely in the hands of the fur manufacturers themselves, and the wholesale and retail hatters most of whom had a good general knowledge of fur values and qualities.

About 1870, some of the New York manufacturers, in an effort to increase the outlet for their products, induced some of the wholesale dry-goods houses and larger department stores to engage in the business of selling furs; and ever since that time there has been a steady rush of people, in all lines of business, to get a share of a trade which they evidently believed still yielded to those engaged in it as large a percentage of profit, as was secured by the Traders who two centuries ago swapped beads and jack knives for skins with the unsophisticated savages.

Many to their sorrow soon discovered that if honestly conducted the fur business, like any other commercial pursuit, pays the dealer only a fair margin; and that success there as elsewhere depends upon a thorough knowledge of the business. Where one has dropped out however a poorer and wiser man, two have always been waiting for a chance to risk the money gained in pursuits with the possibilities of which they were familiar, in an uncertain experiment along lines of endeavor of the inner workings of which they knew little or nothing. The natural result is that where two generations ago there were a dozen responsible Fur Merchants, there are today thousands of dealers handling furs with varying degrees of success; and there has been a corresponding increase in the number of so-called fur "factories."

Take Greater New York as an illustration. In 1870, the fur business there was conducted along legitimate lines by John Ruszits, D. Greenfield, James Brodie, A. Jacobson and Brother, L. Zechiel, G. Lowerre, Mischo and Mueller, Frederick Booss, C. G. Gunther, Geo. C. Treadwell, H. M. Silverman, M. Konvalinka, Charles Herpich, Philip Weinberg, Nichols, Burtnett and Co., Harris and Russak, Duncan, Ash and Jaeckle, Balch and Price, and a few other equally well known furriers.

Today the number of fur manufacturers, of differing degrees of responsibility, who are competing for trade in New York City runs way up into the thousands. Many of them are worthy successors of the men who in earlier days made New York the fur market of the Western Hemisphere; but whether on the whole the change from the old conditions to the new has been a benefit to the trade, or the public, is a question for serious consideration.

We all believe in the day of small things, and in the fur business as in other lines of endeavor some of the greatest successes have resulted from the smallest beginnings; but we can have too much of even a good thing, and what seems to be needed just now in the fur industry is more concentration, rather than a further division of interests.

The small dealer who thoroughly understands the details of the business in which he is engaged, and who has a proper sense of responsibility, and an ambition to establish a reputation for honorable competition and fair dealing with customers, is always an influence for good in the commercial life of his community; but the class who rush into any line of business without any knowledge of the value of the goods they offer for sale, and with no other object than to divert to themselves a share of some one else's profits, demoralize the trade into which they inject themselves; and too often, when they find they cannot make the expected enormous profits by the sale of legitimate goods, rob the public by misrepresentation, and the substitution of inferior grades.

Many of the people selling furs today are neither Fur Traders, Furriers, nor Skin Dealers as the men who supply the manufacturers with dressed skins are called.

They are simply Dealers in Fur who have no experience in manufacturing or technical knowledge of the value or quality of skins. They handle only the products of other makers, and are obliged to depend entirely upon the representations of the manufacturers who supply them with goods. The Furrier is the man upon whom the fur buying public must depend for a square deal, whether they purchase from him direct or from one of the dealers he supplies.

The necessity of considering the responsibility of the dealer when purchasing furs must be apparent to all who remember what a large trade is carried on in what may be termed artificial products. The common and cheaper furs are often so prepared as to resemble rarer and costlier articles. The skill with which piecing is done is somewhat marvelous. All the clippings and cuttings of furs have their uses, and pass into different hands for various purposes. The life of a fur also depends largely upon the method of dressing and the quality of the dye used in coloring. The average purchaser cannot possibly have the knowledge that will protect him from being imposed upon by unscrupulous dealers. There are however so many responsible Furriers and Fur Dealers large and small, that no one except those who are looking for "something for nothing" need ever be the victim of fraud or deception.

The story of the Furriers is not so full of dramatic interest as the history of the Fur Traders, but they are "the men behind the guns" without whose prosaic efforts to make furs fashionable, and to stimulate the demand at various times for different species by the creation of new styles, peltries never would have become valuable enough to cause the Fur Traders to leave their homes and risk their lives in the pursuit of their calling.

To trace the origin of the trade in manufactured furs, we would have to go back, almost, to the origin of man himself. The writer finds as a matter of record that in 1251, in the account of the Master of Robes to Louis IX of France, there is a charge for an ermine lining for a surcoat; in which three hundred and forty ermines were used for the body of the garment, sixty for the sleeves and waist band, and 336 for the frock. We might mention, in passing, that the man who made that coat was not by any means the first furrier; there were many others before him. The heraldic furs of that age were the sable, the ermine, the vair or blue squirrel, and the grison or badger, which are as popular today as they were then; but the furriers of that time had probably never heard of many of the animals whose skins are being used today, and would be as much surprised at the names under which some of the animals with which they were familiar are being sold, as they would be startled at the business methods of the present generation.

No one would care to go back to the time when farmers swapped pumpkins over the fence, and the storekeeper's principal business was trading merchandise with those who were handling other lines of goods. Every reliable furrier, however, is looking forward to the time when a judicious regulation of credits, and the stringent enforcement of laws against false representations, will prevent the dishonest competition that for years has demoralized an industry whose history for centuries has been a record of great and honorable achievements.

In every line of industry standards will continue to be lowered, and honest merchants will be at a disadvantage, until fake advertising is made a states prison offense. The man who secures a hundred dollars in cash by straining the truth is a criminal in the eyes of the law, but the dealer who, by direct lies as to the quality of his wares, obtains two hundred dollars for fifty dollars worth of merchandise is a shrewd business man, in the opinion of everybody, except the few who in some way find out that they have been imposed on. The reputable furrier is the greatest sufferer from this evil, because the purchasing public know less about furs than they do about other articles of merchandise, and a great many of the people will buy any old thing, if they can be persuaded that they are getting it for less than it is worth.

FUR MARKETS.

In the early days, St. Louis was the fur market of the United States, as it was the starting point of all the expeditions to the Far West, and the place where the skins received from the Pacific Coast and the interior trading stations along the old overland route, were either offered for sale or reshipped to New York and Boston. Naturally all the large fur companies had headquarters there, and it was the Mecca alike of the trappers and fur traders who had peltries to dispose of, and the furriers who were looking for supplies. For a number of years, however, New York, owing to the advantages it enjoys as the commercial center of the country and the principal port of entry for foreign merchandise, has been the place to which manufacturers and fur dealers from all parts of the United States have gone for their skins, and manufactured furs. It was, therefore somewhat of a surprise when it was announced, after the government had taken control of the fur industry on the Pribilov Islands, that the first annual sale of seal and fox skins by the representatives of the government would be held at St. Louis on December 16th, 1913.

Heretofore, the skins of these animals were sent by the leasees of the islands to London, to be sold at auction; and the December sales there attracted buyers from all parts of this country. Europe and Canada; so the action of the authorities in designating St. Louis as the place for the government fur sales will do much to restore that city to its former important position in the fur trade, although the facts do not warrant the statement made by the Associated Press that the auction was awarded to St. Louis, because it was the largest fur market in the United States.

Tens of thousands of Russian sables, hundreds of thousands of ermines, millions of squirrels and large quantities of other Russian skins are sold annually at the fairs held in Irbit and Nijni Novgorod, but Moscow is the fur center of Russia, where a large part of the world's supply of Russian Squirrels, Ermines, Persians, Ponies, Marmots and Foxes are originally marketed.

The Chinese traders are the principal purchasers at the fair held annually at Kratka on the Chinese border; but most of the Dog skins and mats, Goat skins and rugs, Thibet lamb skins and crosses, and other Chinese furs, are exported direct from Harbin, Mukden, Hong Kong, Shanghai, Peking, Tientsen and the other points where they are collected.

Leipzig is an important fur center, and the price of Astrachan and Persian lamb skins is largely determined at the sales held at the fair which opens there each year the first Monday after Easter.

Fairs are also held in Leipzig at New Year's and in September, but the chief mart for the sale of furs is the Easter fair which lasts for two weeks from the first Monday after Easter, and is attended by merchants from all the large fur centers in the world. Some American furs are sold at these fairs, but the principal offerings are Cats, Squirrels, Persian Lambs and other Asiatic furs.

The Irbit Fair on the Siberian side of the boundary line between the two continents, is the mart for Russian furs like Squirrel, Ermine, Fox, Beaver, Kolinsky, Russian Fitch, Sables, etc. The Nijni fair is more important than the preceding, and large quantities of Persian, Shiraz and Astrachan lambs, Squirrel skins, Ermine, Bear, Mongolian Goat, White Fox, Wolf and Dog Skins are sold there.

The great fur events of the year however are the sales held in January, March, June and October of each year in the city of London. The January offerings often consist principally of muskrats, beavers and opossums. It is at the March sales that the choicest collection of the Hudson's Bay Company, and the finest consignments shipped to C. M. Lampson and Company and other London brokers are sold at auction to bidders from all parts of the world. Comparatively few buyers attend the June and October sales, when the offerings consist of the less desirable late catches and of unsold lots remaining from the former sales. The reports of the sales made by C. M. Lampson & Company, A. & W. Nesbitt, Ltd., Anning & Cobb, Flack Chandler, Goad, Rigg and Co., Culverwell, Brooks and Cotton, Dyster Halder, Henry Kiver, Barker and Co., Thorp and Welby and Frederick Huth & Co., and the Hudson's Bay Co. in 1913, will give an idea of the magnitude of the different London sales at the present time.

DRESSING, DYEING AND IMPROVING.

At one time the Red Indian was undoubtedly the best dresser of the skins of the Buffalo and other American animals, and the present art of tanning was largely borrowed from the savages. The skins are first placed in an alkali bath, and when the pelt has become soft they are taken out and tubbed; after this they are shaved by passing them over a knife placed in an upright position. Next they are buttered and put into a tub of sawdust, where they are tread by half-naked men until the leather has become soft and supple from the heat of the bodies of the workmen. The skins are then taken out and cleaned and finished. Generally speaking American skin dressers are the best in the world, but in the dressing of squirrel skins the dressers of Weissenfels, in Saxony, surpass all others. This success is probably largely due to the nature of clay and salt deposits available near the town, but however this may be, nearly the whole community of Weissenfels thrives upon this one industry, in which hundreds of men are employed to dress the skins, which are afterwards sorted, matched, and sewed by thousands of women and children into lining plates, that are acknowledged the world over as being vastly superior to the products of their chief competitors in this branch—the Russians.

P. L. Simmonds, writing on this subject, says: "The ancients detached the flesh from the skins with sharpened stones and dried them in the sun; after which they were energetically rubbed with oil and grease extracted from the intestines of the slaughtered animals, and a polish was added to the skins by rubbing them with porous stones. The hides of bullocks, horses and other large animals were used to make the tents which sheltered the early Patriarchs, and the skins of the leopards, tigers and smaller animals supplied the wearing apparel with which they were able to glorify themselves before their fellowmen.

At a later period the adhering particles of flesh remaining on the skin when it was wrenched from the animal were removed with bone, stone and iron instruments, and the skins were washed so as to open the pores and cleanse them from dust and dirt. After this was done they were exposed to the frost. Later still it was discovered that the skins would be greatly improved by plunging them into water containing a solution of alum, and then putting them into vinegar. These baths protected the skins from rotting. After they had been dried in the shade the skins were moistened again and beaten, stretched and otherwise manipulated until they were supple, clean, and free from disagreeable odors. The Indians had a way of loosening the skin from the smaller animals that was cleaner than any other process. They would puncture the skin in two or three places, where no injudy would be done by the cut, and insert a quill. By blowing through the quill the air would be forced between the flesh and the skin, which could then be stripped off without a knife."

Catlin, in his "North American Indians," said: "The Indians dress buffalo and other skins by leaving them in a lye of water and ashes until the hair can be removed; then they strain them on a frame, or upon the ground with stakes and pins driven through the edges into the earth. After they have been in this position for several days with the brains of the buffalo or elk spread over them, the squaws dry and soften the skin by scraping the fleshy side with a bone sharpened at the edge upon which they bear the total weight of their bodies.

As before stated, the Germans surpass all others in dressing squirrel skins, and they have few equals in dressing cats and beavers, the only objection to their method being that it leaves the pelt of large skins rather thick.

The English specialties are chinchilla, marten, sable, skunk and fox, the only objection to their processes being that in cold climates the moisture in English dressed skins is apt to freeze and cause them to become hard. This never happens to Russian dressed skins, but they have an unpleasant smell which it is hard to eradicate. This is also true of the Chinese method, which leaves a very unpleasant smelling powder on the skins, but the Chinese are successful in dressing sea otters and tigers.

The dyeing of fur skins is an ancient art, but the present generation has brought it to such a state of perfection that, in many cases, no one but an expert can tell when skins have been touched to deepen or change their color. The English have long excelled in dyeing seal skins. They first use a mordant of lime; and then, after the ground color has been trodden in with booted feet, a dye composed of copper dust, antimony, camphor, verdigris, and roasted gall nuts is applied to the top of the fur with a brush. Formerly twelve to fourteen coats of this dye were applied, but at present the same results are obtained with fewer applications, and some dyers now heat the dye and dip the skins into the mixture. In fact the art of dyeing with the brush has been largely superseded by the dipping process, especially where vegetable dyes that will not injure the leather are used. The Germans are unsurpassed in dyeing black. Leipzig-dyed Persian, Astrachan and Ukrainer lamb and Lynx skins have a brilliancy of color and pliability of pelt that cannot be found in others. Whether this is due to the nature of the water and the climate, or the ingredients used and methods employed, is a disputed question; but American dyers are so rapidly improving in seal and black dyeing that they will doubtless soon obtain in these, as they have in so many other cases, results equal to the best foreign products.

The art of imitating, changing and improving furs, is carried on with very great success. By means of certain operations and dyes, the leopard skin is imitated; muskrats, susliks and marmots are striped like mink; wolves are made to appear like foxes; martens, minks and sables are darkened; raccoons, opossums and white skunks are dyed black or natural skunk color; silver foxes are successfully imitated by dyeing the red fox skins and pointing them with badger hairs; off color white foxes have the top hair dyed so they look like the natural blue foxes; and this year, we even have bright yellow, sky blue and pink Belgian hares.

The seals, otters, beavers, conies, muskrats, and a number of other animals have a soft, thick under fur, which is better adapted for the purposes of the furrier's art when the long stiff hairs which form the top skin have been removed. These skins were formerly sheared, and later the long top hairs were plucked out by hand; now the desired result is accomplished by shaving a layer off the under side of the pelt when these stiff hairs, which come further through the leather than the under fur, are loosened so they can easily be plucked from the fur side with blunt knives. Many short hairs however elude this plucking process, and these are removed by a machine which divides the soft fur by a current of air, and leaves the stiff hairs standing alone so they can be sheared off close to the skin without injury to the under fur.

English dyes are celebrated for their brilliancy, but are said to reduce the quality of the skin. The French dyers plunge the skins into a large vat filled with logwood dyes. Owing to the vegetable nature of their dye they do not reduce the quality of the skins as much as the English dyes, but they are not as permanent. Belgian dyed skins are not as desirable as the French as cheap madder dyes are used in coloring them. Strange as it may seem, the Chinaman, with all his ingenuity, is a very poor dyer of furs.

SKINNING AND CASING.

The commercial value of a skin depends as much upon the way it is removed from the animal and stretched by the trapper, as upon the skill of the dresser. Otters, foxes, martens, minks, opossums, civets and skunks should be cased; that is, taken off whole. Beavers and raccoons should be skinned open; that is, ripped up the belly from the vent to the chin, and the skin removed by flaying.

Where skins are to be cased a cut should be made up the center of one hind leg and around the vent and down the other leg; then if the tail is worth preserving, the skin should be carefully stripped from the caudal bone without cutting the skin, except in the case of skunks and otters, whose tails should be split, spread and tacked on a board. The skin should then be drawn back over the body, pelt side out and fur in, the same as in skinning an eel or drawing off a glove. It will peel off easily if a few ligaments are cut. Care should be taken not to cut too closely around the nose, ears and lips.

Cased skins should be stretched on boards, tapering from four and one-half inches in width down to three inches for mink, and from six to five inches for foxes. The boards for the mink skins should be three feet long and those for foxes four feet. Stretching boards should be rounded at the small end, smooth and even on the edges, and not more than three-eights of an inch thick; and the boards for the mink should taper slightly down to within four or five inches of the point, and the fox boards to within eight inches of the rounded end. Stretching boards for other animals should be made in proportion, according to the size and shape of the animal.

All the fat and flesh should always be removed from the skin immediately after the skin is on the board. If a skin is wet when taken from the animal it should be drawn lightly on a board, flesh side in, until the fur is quite dry, then the skin should be turned flesh side out and stretched. Skins should never be dried in smoke or at a fire, nor in the sun, as they are liable to become scorched or hard, when they will not dress properly and are of no value. They should be dried in a well covered shed or tent where there is a free circulation of air; and no preparation such as alum and salt should be used, as it only injures them for the market. The noses must never be stretched out long, as fur buyers and dealers are inclined to class long-nosed skins as "southern" and to pay a small price for them, as all southern skins are much lighter in fur than those of the north.

Foxes of the various kinds should be cased and put on boards, fur side in, for a few days, or until dry. As the pelt is thin, they dry soon, when they must be taken off and turned fur side out. In shipping, care should be taken that they are not packed against furs with the flesh side out.

Skunks should be cased fur side in, and stretched on boards for several days. If the white stripe is cut out or blackened it reduces the value of the skins.

Minks should be cased fur side in and stretched on boards for several days, or until dry, and left with the fur side in when removed from the board.

Muskrats should be stretched fur side in for a few days. and left fur side in when removed from the board. The tails may as well be cut off when skinning, as they are worthless.

Opossums are also best if stretched on boards fur side in and left in that condition after removing the boards. The tails should be cut off when skinning—they have no value.

Raccoons should be stretched open; that is, nailed flat on boards, or the inside of a building. Some dealers allow as much for coons cased, from any section, while others prefer only southern coon cased.

Otters should be cased and stretched fur side in. The pelt being thick and heavy they take several days to dry properly. They should be shipped flesh side out.

Beavers should be split, but stretched round and left in the hoop or stretcher for several days.

TAXIDERMY.

The old method of stuffing animals is as different from scientific taxidermy as the skin covering of the aborigine is from the finished fur garment of the fashionable society woman. The taxidermist of today carefully molds a form according to accurate measurements and photographed outlines, and after he has constructed a perfect model of the animal the skin is stretched over it, the result being a reproduction as near to nature as it is possible to secure, the effect in some cases being so life-like as to be startling.

Formerly the skins were wired or otherwise fixed on an internal framework, and cotton, tow or any other available material was introduced until the form was stuffed to the desired shape; later a solid mass of tow was shaped into something like the semblance of the animal and introduced into the skin, which was then molded upon this artificial body, but neither of these processes produced the results obtained by the scientific methods now employed.

GRADING.

Beaver—Ten dollars is the present quotation for "Large" raw Beaver skins; seven to eight dollars for the "Medium;" five dollars for the "Small," and three dollars for the "Cubs." The best American skins come from Canada, Maine and Nova Scotia.

The "Civet Cat" skins from the Northern portion of the habitat of the Little Striped Skunk are worth about ten cents more than those from the central and southwestern states. These skins are graded as "Large," "Medium" and "Small;" the relative values of the different grades being seventy-five, fifty and thirty-five cents.

Domestic or House Cats are graded as "Black," Spotted" and "Small;" the price for black being fifty cents, for the spotted twenty cents, and for the small five cents.

Fishers are graded as "Dark," "Brown" and "Medium," and the price is also influenced by the size and quality; prime skins being worth from twelve to thirty dollars and upwards.

Foxes—The finest **Red Foxes** come from Labrador, Nova Scotia and Eastern Canada, and are worth raw from four to twelve dollars each and upwards, according to size, color and quality; Maine, Massachusetts, Vermont and Ontario skins are worth a dollar less than the foregoing, and a dollar more than New York, Northern Michigan and Connecticut Foxes. Southern and Southwestern skins are the poorest, and are worth less than half what is paid for those secured in Maine and New York. The intermediate grades are obtained from the Central and Western States. No. 1 and No. 2 Foxes are also graded according to size, "Large," "Medium" and "Small;" the No. 3 and No. 4 are all small.

The New York, Pennsylvania, New Jersey, Michigan, West Virginia and Northern Indiana and Ohio **Grey Fox** skins are worth from ten to fifty cents more than those from Virginia, Delaware, Maryland and North Carolina; which in turn grade somewhat higher than the Southern Ohio and Indiana, Kentucky, Missouri and Oklahoma skins.

Silver Foxes bring from one thousand to twenty-five hundred dollars, according to size, quality and color.

The best **American Lynx** skins come from Canada, Maine and Nova Scotia, and are graded as No. 1—Large, Medium and Small; No. 2—Large, Medium and Small; No. 3, and No. 4; the prices ranging from three dollars to twenty-five dollars and upward each.

Minks are graded closer than any other skins; first they are sorted with reference to locality, then they are graded according to quality and color into dark and brown and No. 1, No. 2, No. 3 and No. 4 skins, after which the No. 1 and No. 2 skins are again sorted into Large, Medium and Small before a valuation is placed on them; No. 3 skins are out of season skins of little value, and those finally graded as No. 4 are small and stagy, or damaged to such an extent that they are comparatively worthless.

Maine, Labrador, Nova Scotia and Eastern Canada skins are known as "North Eastern" Mink; those from Northern New York and New England are called "Eastern Minks;" the Central and Southern New York and Michigan, Pennsylvania, New Jersey, Indiana, Ohio, Illinois, West Virginia, North Carolina, Virginia, Northern Kentucky, Delaware and Maryland Minks grade between the '"Eastern" and the "Western" Minks, as the skins from Kansas, Missouri, Oklahoma and Nebraska are called. "Southern" and "South Western" Minks are the lightest in color and poorest in quality; but the "North Western" skins from Wisconsin, Northern Michigan, Minnesota and the regions beyond, are of good color, and while the fur is not as soft or rich as that on the "Eastern" Minks, the skins are so much larger that they often bring almost as high prices as the "Eastern" skins although the general average is considerably less.

Muskrats—Raw skin buyers pay from five to fifteen cents more for "Large Winter" than they do for "Large Fall" rats. and the "Small" skins are worth from fifteen to twenty-five cents less than the large ones of the same grade; when the price for perfect "Large Winter" skins is fifty-five cents, "Kitts" are valued at about eight cents.

New York State, New England, Canada, New Brunswick, Northern Pennsylvania, Northern New Jersey, Ohio, Indiana, Michigan and Illinois Muskrats are worth from five to ten cents more than those from Delaware, Kansas, W. Virginia, Virginia, Central Pennsylvania, Southern Ohio, Southern New York, North Carolina, Kentucky, Maryland, and Missouri. The poorest skins come from Texas and Louisiana, and bring about half of the price paid for the New York State skins, and about ten cents less than Tennessee, Georgia and Alabama rats.

Black muskrats are more numerous in the Delaware, Maryland and Virginia District than elsewhere, and are worth about fifty per cent. more than the regular brown variety; the comparatively small number of black skins secured from the New York, New England and Canada district bring about five cents more than the southern skins of this variety.

Opossums are graded according to size and quality as No. 1—Large, Small and Medium; No. 2—Large, Small and Medium; No. 3, and No. 4. The best skins come from the Eastern and Central States; next in quality are the skins from the old "Border States," and the poorest skins come from the South and Southwest; prices for No. 1—Large, range from sixty-five cents to ninety cents and upward.

The finest **American Otters** come from Maine, Nova Scotia, Labrador and Eastern Canada; next in quality are the skins from Northern New York, New England, Western Canada and Northern Michigan; Pennsylvania, New Jersey, Delaware, West Virginia, Mississippi, Northern Kentucky, Illinois, Kansas, Virginia and North Carolina skins are lighter in fur and color than either of the foregoing, and the skins from the extreme southern states are only worth about half the price paid forCanada and Maine skins. Otter skins are graded No. 1, No. 2, No. 3 and No. 4, according to color and quality, and then regraded according to size as "Large," "Small" and "Medium."

Raccoons—New York, New England, Canada, Northern Pennsylvania and Michigan Raccoons are the finest; but Central Pennsylvania and Michigan, Northern Ohio, Illinois and New Jersey skins almost equal them in quality. Central and Southern Ohio, Indiana, Kansas and Northern Kentucky and Missouri skins are considerablylighter in fur and color; and the skins from further south are still less valuable, those from Georgia and Florida being worth only about one-third the price asked for skins from the New York and New England district. Raccoons are graded as "Large," "Medium" and "Small," according to size; and as No. 1, No. 2, No. 3 and No. 4, according to quality and color. A large No. 1 New York skin is worth from three dollars and fifty cents upwards, the extra dark and black skins bringing as high as seven dollars and fifty cents.

H. B. Sable—"Dark" Eastern and Canada Martens are worth from fifteen to eighteen dollars and upwards, some bringing as high as ninety dollars; the "Brown" skins are worth about forty per cent. less, and the "Pale" skins some fifty per cent less than the price asked for dark skins of the same size and quality.

Skunks are graded as "Black," "Short Stripe," "Narrow Stripe" and "Broad Stripe;" the relative values of the different grades being four dollars, three dollars, one dollar and sixty cents, and seventy-five cents. The best skunks come from New York, Northern Ohio, Northern Pennsylvania, Michigan, Massachusetts, Connecticut, Maine, Vermont and Canada; but they are almost equalled in quality by those from New Jersey, Central Pennsylvania, West Virginia, Ohio, Illinois, Kansas, Nebraska and Oklahoma. The skins from Indiana, Maryland, Virginia, Southern Ohio, Northern Kentucky and North Carolina are less desirable; and those from the other southern states are poorer still.

Wild Cat skins are graded as "Large," "Medium" and "Small," and the heaviest furred come from Canada and Maine. Those from the Central States are of medium quality, and Southern and Southwestern skins are very poor. Wild Cats, quality for quality, are worth about one-third the price of Lynx skins.

SIZE, COLOR AND QUALITY.

Wild animals, like human beings, seem to develop best where they are obliged to put forth some effort to procure the means for subsistence. The largest and most powerful representatives of any species are not found in the fertile valleys but on the barren mountains, and where the range of a species extends through different latitudes the animals increase in size as they move away from the equator and approach the poles. The males of any species are larger than the females. Inbreeding makes the stock become more symmetrical but smaller, while crossing the various strains produces larger animals.

With the exception of the beaver and Alaska red fox the darkest hued representatives of every species are those living nearest the equator. Cold seems to cause the fur of all animals to become lighter in color, and white mammals as a race are found only in the arctic regions. The fur also becomes lighter with age, the new growth with a few notable exceptions always being darker than the old coat. White, black, brown, and grey are the predominating colors; but red and yellow mammals are quite numerous, and a few species even show a blue tinge.

White has always been considered a mark of distinction in fur. The North American Indian set a high value on a white "Buffalo"and would give several horses in exchange for it. The Alaska Indians would give five otters or foxes for a single white marten. White elephants are regarded with reverence in Siam. The sacred ox of India is white, and the coronation robes of royalty have always been made of white ermine.

The beaver attains its greatest depth of color in certain districts of Canada, and the Alaska Red Fox is much darker than the more southern representatives of the species, but with very few exceptions there is a decrease in pigment as animals move away from the equator and approach the poles. The tropical mammals have been known to become lighter haired when they have been kept in captivity in colder climates.

With the exception of the Badger, Hamster, Panda and Ratel which are darker on the under than the upper parts, all fur bearing animals have darker fur on the back than on the sides and belly.

Albino specimens of different animals are occasionally seen, but they are undoubtedly freaks rather than distinct species of their genus.

The finest specimens of any species are found in the highest latitudes. On all animals the quality of the fur improves with cold, being poorest on those whose habitat is in the torrid zone unless they live at a sufficiently high latitude to secure for them a low temperature. In the temperate zone the quality of the fur depends upon the severity of the winter. In all climates the fur of animals found in the dense forests is deeper, silkier, and glossier than that of mammals whose range is on the open steppes or prairies; and animals living on the shores of lakes and rivers have a finer, softer coat than those who are exposed to the sea winds on the coast. The fur on all animals is at its best when it is from one to two years old. On older animals the hair is coarse and scraggy, while the pelt of so-called baby skins is very tender and the fur on them is too soft to be servicable. The fur on any animal usually reaches its full growth in mid-winter, and only skins taken between that time and early spring are in fine condition; before that time the hair is short and stagy, and later the animal begins to shed its old coat for a new one and the hairs of skins taken at that time will continue to fall out, even after the skins have been dressed.

The sexes of cattle and sheep are about equal in number, and the same is true of dogs and seals the only other animals of which we have any reliable statistics. Naturalists generally claim that the number of females in most species exceeds the males, but it is difficult to understand upon what they base their calculations. If it is upon the polygamous nature of most mammals the seals are a positive proof to the contrary.

RELATIVE DURABILITY AND WEIGHT.

The life of furs can now be so prolonged by dry cold storage, which not only protects them from moths but prevents the change of color and the deterioration that formerly resulted from the evaporation in high temperatures and hot atmospheres of the natural oils in the skin and hairs, that the durability of the fur must be considered as well as the cost in determining its real value.

Taking the **Otter** at 100 as the standard the relative durability of some of the best-known furs is shown in the following table, which also gives the weight per square foot of the skins mentioned:

	Ounces.
Astrachan-Moire	10—3
Beaver-Natural	90—4
-Plucked	85—3⅞
Bear-Black or Brown	94—7
Chinchilla	15—1½
Civet Cat	40—2¾
Cony	20—3
Ermine	25—1¼
Fox-Natural	40—3
-Dyed Black	25—3
-Blue	20—3
Genet	35—2¾
Goat	15—4⅛
Hare	5—2¼
Jackal	27—4½
Koala	12—4
Kolinsky	25—3
Krimmer	60—3
Leopard	75—4
Lynx	25—2¾
Marmot-Dyed	20—3
Marten-Baum	65—2¾
- " Blended	45—2¾
-Stone	45—2⅞
- " Dyed	35—2⅞
Mink-Natural	70—3¼
-Dyed	35—3¼
-Japan	20—3
Mole	7—1¾
Muskrat-Natural	45—3¼
-Seal	33—3¼
Nutria-Plucked	25—3¼
Otter-Natural	100—4½
-Plucked	95—3⅞
-Sea	100—4½
Opossum-Natural	37—3
-Dyed	20—3
-Australian	40—3½
Persian	65—3¼
Pony-Russian	35—3½
Rabbit	5—2¼
Raccoon-Natural	65—4½
-Dyed	50—4½
Sable-Natural	60—2½
-Blended	45—2½
Skunk-Natural	70—2¾
-Tipped	50—2⅞
Seal-(Hair)	80—3
- " -Dyed	75—3¼
-(Fur)	80—3½
- " -Dyed	70—3⅛
Squirrel-Back	25—1¾
- " Blended	20—1⅞
Wolf-Natural	50—6½
-Dyed	30—6¾
Wolverine	100—7

The foregoing figures refer to skins worked up into muffs, neckpieces, caps, gloves and garments with the fur outside. In estimating the wearing quality of linings for women's wraps the **Sable Gills,** which weigh 2⅞ ounces to the square foot and have less than forty per cent. of the strength of unplucked Otter fur, are taken as the standard at 100. The relative durability and weight of other linings is as follows:

	Ounces.		Ounces.
Coney	40—3	Sable-Skin	85—2½
Ermine	57—1½	-Head	65—1¾
Fox-White	50—3	Squirrel-Back	50—1¾
Hamster	10—1¼	-Belly	20—1¼
Kit Rat	60—3	-Head	35—2½

ANNUAL SUPPLY.

All estimates as to the number of Fur-Bearing Animals killed annually are largely speculative. It is true that the sales reports from London, Leipzic and the Russian Fur Markets show how many skins are sold each year at the regular fur sales, but they do not tell how many of the offerings were skins held over from previous years or resold for former purchasers; and there is positively no way of finding out how many skins pass directly from the hands of the trappers and collectors into those of the manufacturers, nor how many are kept by the hunters for their own personal use.

The following figures are based upon information received from a number of sources, and while necessarily only tentative give the reader an approximate idea of the quantities of the various skins marketed each year, and positive information as to the localities from which the different kinds are obtained:

	America	Europe	Asia	Africa and Australia
Astrachan	......	1,000,000	......	......
Broadtail	......	......	100,000	......
Badger	30,000	100,000	30,000	25,000*
Bassarisk	40,000	......	......	......
Bear-Black	20,000	......	1,000	......
-Brown	2,000	2,000	7,000	......
-Grizzly	1,000	......	......	......
-Polar	350	250	400	......
Beaver	80,000	......	1,000	......
Cat-Domestic	75,000	700,000	150,000	......
-Lynx	40,000	......	20,000	......
-Tiger	......	......	10,000	5,000
-Wild	......	10,000	30,000	......
Chinchilla (Peru)	1,000	......	......	......
-Bastard (Chili)	20,000	......	......	......
" (Bolivia)	10,000	......	......	......
Chinchillones (Bolivia and Peru)	15,000	......	......	......
Civet	......	......	30,000	......
"Civet Cat"	150,000	......	......	......
Coney (Rabbit)	......	50,000,000	......	15,000,000*
Dog-Chinese, etc.	......	......	400,000	......
Ermine	150,000	10,000	750,000	......
Fisher	12,000	......	......	......
Fitch (Pole Cat)	......	150,000	200,000	......
Fox-Blue	5,000	700	2,500	......
-Cross	15,000	......	10,000	......
-Grey	50,000	......	150,000	......
-Kitt	10,000	......	......	......
" (Brazil)	40,000	......	60,000	......
-(Patagonia)	10,000	......	......	......
-Red	200,000	700,000	200,000	50,000*
-Silver	5,000	......	1,000	......
-White	30,000	10,000	25,000	......
Goats-Chinese	......	......	400,000	......
" Kids	......	......	800,000	......
Guanaco (S. A.)	20,000	......	......	......
Hamster-Germany	......	1,500,000	......	......
-Austro-Hungary	......	500,000	......	......
Jackals	......	......	10,000	15,000
Jaguar (S. A.)	300	......	......	......
Kolinsky	......	......	200,000	......
Kangaroo	......	......	......	50,000*
Krimmer	......	......	400,000	......
Leopard	......	......	5,000	6,000
-Clouded	......	......	250	......
-Snow	......	......	750	......
Leopard Cats	5,000	......	......	......

	America	Europe	Asia	Africa and Australia
Lions	......	......	......	200
Lynx	50,000	10,000	......	......
Marmot	25,000	500,000	3,000,000	......
Marten-Baum	......	150,000	......	......
-Stone	......	250,000	......	......
Mink	500,000	500	20,000	......
-China (Weasel)	......	......	300,000	......
-Japan	......	......	200,000	......
-Russian	......	20,000	......	......
Mole	......	1,000,000	......	......
Monkey	......	......	......	10,000
Moufflon	......	200,000	......	......
Muskrat	5,000,000	5,000	......	......
Musk Ox	500	......	......	......
Nutria (S. A.)	500,000	......	......	10,000*
Opossum	1,000,000	......	......	2,500,000*
Otter	30,000	20,000	40,000	......
-(S. A.)	5,000	......	......	......
-Sea	350	......	......	......
Palmi	......	......	80,000	......
Perwitsky	......	3,000	50,000	......
Persian Lamb	100	......	1,500,000	......
Poney	......	50,000	150,000	......
Raccoon	500,000	......	......	......
Raccoon-Dog	......	......	300,000	......
Ringtails	......	......	......	50,000*
Sable-Russian	......	......	75,000	......
-H. B.	100,000	......	......	......
-Japan	......	......	5,000	......
-Chinese	......	......	10,000	......
Skunk	1,200,000	......	10,000	......
-(S. A.)	5,000	......	......	......
Slink Lamb	......	......	100,000	......
-(S. A.)	350,000	......	......	......
Shiras Lamb	......	......	150,000	......
Squirrel	......	7,000,000	6,000,000	......
Susliki	......	......	500,000	......
Tiger	......	......	500	......
Vicuna (S. A.)	15,000	......	......	......
White Weasel	200,000	......	......	......
Wallaby	......	......	......	750,000*
Wolf-Prairie	40,000	......	......	......
-Timber	8,000	5,000	15,000	......
Wolverine	3,000	1,000	4,000	......
Wombat	......	......	......	200,000*

Items marked * are Australian products exclusively.

The Japanese skins have been included in the Asiatic estimates.

The present yearly catch of **Hair Seals** is about 250,000. Under the existing agreement between the maritime powers there will be no **North West Coast Fur Seals** for the next five years, the killing of **Alaska Seals** on the Pribilof Islands will be limited to about 3,000 a year and the supply of **Copper Island Skins** will be less than 5,000 per year. From the **South Sea Islands** about 5,000 skins are received annually, and the same number of **Cape Horn Skins** come into the market each year, together with 3,000 **Cape of Good Hope Skins,** and about 10,000 **Lobos Island Skins** from the South Atlantic.

About one million of the **European Rabbit** skins come from Russia, a half a million come from Germany, twenty million from Belgium and the balance from France.

Holland supplies two hundred thousand of the **European Cat Skins,** Germany one hundred thousand, Russia three hundred thousand, and the rest come from different parts of the Continent.

Germany is credited with two hundred and fifty thousand of the **European Red Foxes,** Russia with one hundred and fifty thousand, and Norway with twenty-five thousand. Of the Asiatic supply about sixty thousand come from Siberia, and fifty thousand from China and Japan.

Most of the **Tanucki** or **Raccoon-Dog** skins are shipped from Japan; but China furnishes about one hundred and fifty thousand of the skins, and Korea about thirty thousand.

More than one-third of the **European Pole Cats** come from Germany. The skins from the eastern provinces of European Russia are so much like the Siberian variety that they are included with the latter in the Asiatic estimate.

Of the **Baum-martens,** fifty thousand come from Germany, fifty thousand from Russia and twenty thousand from Norway and Sweden.

Germany contributes one hundred thousand of the **Stone Martens,** Bosnia and Turkey fifty thousand, and Russia an equal quantity.

Of the **Asiatic Marmots** China and Manchuria supply five hundred thousand. The balance come from Siberia.

With the exception of a few hundred thousand skins from China and a small number from Japan, all the **Asiatic Squirrels** come from Siberia. Six million of the squirrel skins credited to Europe come from Kasan and other Russian provinces.

INCREASING QUANTITIES.

In 1875, P. L. Simmonds said: "It must be remembered that fur bearing animals like human beings and cattle are liable to periodical failures of food, or periodical inroads of disease. Experience shows that their abundance runs in cycles. The failure one year of an insignificant class of animals may cause the decrease the next year of a far more valuable beast which feeds on the former. The whole chain of animal life is more or less linked together, and the different species as they depend on each other fall off or increase again, according as the supply of food and the vigor of each class may be more or less abundant.

"In spite of the fact that some species have been exterminated and others decimated by indiscriminate and wanton slaughter, on the whole the quantity of skins of wild animals seems to be increasing yearly. We drive animals back at some points, but for the last two centuries the grand total of skins collected annually has been steadily increasing; and it does not seem as if the globe was sufficiently peopled yet for man to arrest the production of animal life. In fact, agriculture increases the production of some fur bearing animals by augmenting their food supplies; and the changes in fashion give the species that is threatened with extermination one year, an opportunity to recover lost ground in the next while a new favorite is being hunted."

Some people may be disposed to question the truth of the statement that upwards of a hundred million fur producing animals are killed every year, but a careful consideration of the statistics available shows that the actual total for the past few years has far exceeded that figure;

and that some of the animals that are most hunted are showing an increase in numbers instead of falling off, so it appears that the contention of Mr. Simmonds is as true today as it was nearly forty years ago. It is a fact that some of the larger wild animals are, and have been for some time past, steadily decreasing, but on the other hand there are species that could be mentioned which are increasing in numerical strength every year in spite of vast numbers that are slaughtered to supply the demands of commerce.

The following figures showing the shipments of the Hudson's Bay Company in 1856 and 1875, were given by Mr. Simmonds in support of his contention. The reader will be interested in a comparison of these figures, with the reports that show the quantities offered at the London sales by C. M. Lampson & Co. in 1913.

	1856	1875
Badger	1,105	2,001
Bear	9,255	5,898
Beaver	74,482	100,721
Fisher	5,182	2,186
Fox, cross	1,951	1,961
Fox, kitt	3,370	2,699
Fox, red	7,371	7,644
Fox, silver	613	603
Fox, white	10,292	4,333
Lynx and Lynx Cat	11,634	15,661
Marten	179,275	61,782
Mink	61,516	62,760
Musquash	258,791	503,948
Otter	13,740	9,825
Sea Otter	290	11
Porpoise, half skins	483	131
Rabbit	90,937	48,291
Raccoon	1,798	1,632
Seal, fur	36	1,427
Seal, hair	5,263	3,743
Skunk	11,319	2,331
Wolf	7,576	1,608
Wolverine	1,142	1,052
Total	757,431	842,248

C. M. LAMPSON & CO. REPORT, 1913.

	January	March	June	October
Badger	1,887	3,529	4,438	2,904
-Japanese	1,254	1,935	978	1,092
Bear	3,150	5,294	3,966	5,098
Beaver	7,575	7,498	3,417	4,580
Cat-Civet	37,102	37,349	19,894	13,823
-House	14,561	35,239	23,450	24,427
-Wild	8,942	6,594	5,797	13,977
Chinchilla-Bastard	......	......	......	......
-Real	3,624	12,300	1,731	2,339
Ermine	58,747	79,718	70,315	43,252
Fisher	433	1,042	448	499
Fitch	4,050	6,777	10,043	8,145
Fox-Blue	248	2,388	88	787
-Cross	539	2,030	502	1,041
-Grey	5,720	13,418	7,291	6,593
-Kitt	17,806	5,893	8,146	31,443
-Japanese	4,474	3,106	1,679	6.058
-Red	15,393	17,889	26,254	36.859
-Red Australian	45.695	19,995	10,560	49,457
-Silver	77	553	113	213
-White	5,196	2,279	1,018	4,250
Kangaroo	4,022	4,295	695	16,682
Kolinsky	18,646	22,900	15,326	86,945
Lynx	1,571	717	2,651	3,161
Marten	6,428	8,879	5,997	6,257
-Baum	541	471	977	1,093
-Japanese	5.453	550	683	2,369
-Stone	1,033	2,596	1,939	2,052
Mink	32,620	51,125	12,203	24,671
Mole	203,985	312,449	447,164	491,526
Muskrat	1,635,768	826,394	784,575	614,273
-Black	10,870	17,060	36,105	12,729
Opossum-American	272,068	323,393	165,552	54,581
-Australian	90,155	87,500	20,498	77,447
--Ringtail	61,641	33,234	3,741	193,426
Otter	5,003	4,426	2,403	2,571
Raccoon	70,914	140,611	54,966	36.229
Sable-Japanese	......	......	57	170
-Russian	1.670	8,294	59	1,487

	January	March	June	October
Seal-Dry Hair	1,229	207	87	17
-Dry Fur	......	204	34	......
-Salted Fur	5,570	1,795	570	7,010
Sea Otter	......	81	......	......
Skunk	314,783	334,379	155,038	59,438
Squirrel	212,790	123,197	141,658	150,532
-Sacs & Plates	7,919	4,932	4,314	5,906
Wallaby	331,017	171,117	152,702	225,654
Wolf	18,036	20,380	8,312	6,487
Wolverine	250	692	190	609
Wombat	1,106	252	1,622	1,696

PRICES.

The prices of skins are regulated by the condition of the pelt as well as the quality of the fur. If they have been torn in the trap or riddled with shot or otherwise mutilated they cannot be graded as No. 1 skins, no matter how fine the quality of the fur. The skins that have been well stretched and dyed bring better prices than those of the same quality that have been carelessly handled. Collectors always prefer minks, muskrats, otters, fishers, opossums and skunks when they are "cased"; that is, not cut open on the belly. Experts are able to judge the quality of cased skins by the appearance of the pelt. The veiny skins are generally poor in quality; and half-seasoned skins have a dark bluish stripe down the back or side. The pelt of stagy skins is quite dark, having a uniform blue hue.

The question of locality is also an important factor in determining the value of skins; for instance, the finest skunks are found in Ohio, while the best minks come from northern New York, Maine, and Nova Scotia. As a general rule the furs of the eastern are better than those of the western provinces of Siberia; but the ermine near the Rivers Irkutz, Oby and Ishin form a notable exception, being worth three times more than those found beyond the Lena River.

An idea of how the prices of certain skins have advanced can be formed by a comparison of the figures quoted in 1875, and the prices ruling today:

	1875	1913 Each.
Beaver	$1.00 per lb.	8.00— 25.00
Bear—Black	5.00— 8.00	8.00— 50.00
Bear—Brown	7.50	15.00— 30.00
Ermine	.50	1.50— 5.00
Fisher	5.00	15.00— 50.00
Fox—Black	100.00	500.00—1800.00
Fox—Blue		35.00— 100.00
Fox—Cross		20.00— 100.00
Fox—Grey		3.00— 7.00
Fox—Red		5.00— 20.00
Fox—Silver	50.00	125.00—1200.00
Fox—White		20.00— 50.00
Fur Seal	10.00	30.00— 125.00
Lynx	3.00	12.50— 50.00
Marten	5.00—10.00	10.00— 50.00
Mink	2.00	2.50— 20.00
Muskrat	.20	.40— 1.00
Marmot (Siffleur)	.50	1.00— 2.00
Otter—Common	5.00	10.00— 60.00
Otter—Sea	50.00—80.00	250.00—1800.00
Squirrel	.12	.40— .75
Wolf	2.50	2.00— 12.00
Wolverine	1.00	12.00— 30.00
Wild Cat	.75	1.50— 10.00

During the period from 1882 to 1910 Black Foxes advanced 400% in price, Red Foxes 500%, Sea Otters 300%, Lynes 800%, Persians 300%, Chinchillas 1,400%, Skunks 250%, Minks 800%, Muskrats 500%, Marmots 500%, Stone Martens 450%, Sables 400%, Japanese Mink 500%, Japanese Marten 1,000%, Japanese Fox 500%, Chinese Weasels 500%, Australian Opossum 1,200%, Kangaroos 1,200%, Native Cats 1,200%, Wallabies 1,600%, and Wombats 600%.

The following table shows the number of skins shipped from Alaska during the year 1913 and the prices at which they were billed to the consignees:

Species	Number	Average Value	Total Value
Bear, black	698	$ 7.50	$ 5,212.50
Bear, brown	19	9.00	171.00
Bear, glacier	5	15.00	75.00
Bear, polar	9	40.00	360.00
Beaver	89	10.00	890.00
Ermine	7,957	1.36	10,821.52
Fox, black	3	600.00	1,800.00
Fox, blue	502	45.00	22,590.00
Fox, blue, Pribilof Islands	384	56.53	21,708.48
Fox, cross	603	17.00	10,251.00
Fox, red	8,018	8.50	68,153.00
Fox, silver gray	142	250.00	35,500.00
Fox, white	3,108	12.50	38,850.00
Fox, white, Pribilof Islands	29	17.29	501.43
Hare, Arctic	55	40	22.00
Lynx	2,720	21.50	58,480.00
Marten	12.999	12.50	162,487.50
Mink	31,363	4.50	141,133.50
Muskrat	123,925	.40	49,570.00
Otter, land	1,480	14.00	20,720.00
Otter, sea	1	200.00	200.00
Reindeer, fawn	4	1.00	4.00
Seal, fur	3,764	37.50	141,290.32
Seal, hair	333	1.50	499.50
Squirrel	611	.08	48.88
Wolf	103	9.00	927.00
Wolverine	189	10.00	1,890.00
Total			$794,156.63

TARIFF.

Long before General Hancock said, "The tariff is a local issue," John Jacob Astor proved by the representations he made to the government on two different occasions that what the American business man really wants is protection for the product he is selling, and an open market for the goods he is compelled to buy. In 1807, when he felt that the Mackinaw Company and other competing traders were interfering with the profits of his business, Mr. Astor asked the government to aid and protect him in a scheme that would secure to him a virtual monopoly of the fur trade of America. In 1829 he addressed the following letter to Senator Bentley with reference to duties imposed on articles that he traded to the Indians: "It is known that none of the woolen goods fit for the Indian trade such as Indian blankets, strouds, and cloths of particular descriptions are as yet manufactured in this country. We are therefore obliged to import them from England, and it so happens that those are just the articles paying the heaviest duty. The English traders have theirs free of duty which enables them to bring their goods sixty per cent and over cheaper than we pay, and they are thereby enabled to undersell us. Their furs and skins cost them a little more than half what we have to pay for ours, but this is not all. They are by these same means enabled to sell their furs here in New York, and actually do come and undersell the American traders. It is unaccountable that they should be permitted to bring their furs here free of duty, while we if we send any to the British Dominion are obliged to pay fifteen per cent duty."

If the duty could have been taken off the woolen goods and put on the furs Mr. Astor probably would have been satisfied; but how about the other fellow?

The reader doubtless smiles at Mr. Astor's inconsistency, entirely oblivious of the fact that history repeats itself and that we of today, sub-consciously perhaps, take the same position. The furrier who worked to keep the duty at from fifteen to fifty per cent. on manufactured furs cannot understand why the government compells him to "pay tribute" to the sugar trust by keeping a tariff on that product for the next three years; and the man who feels that he has been unfairly dealt with because the duty on wool was reduced insists that he ought to have the right to buy his furs where he can get them the cheapest. From all this it seems as if the tariff is not even a local issue but simply a question of individual profits, and that men uphold or condemn the tariff legislation which from time to time disturbs the commercial interests of the country according to its effect on their personal interests.

The Tariff Act passed by the United States Congress October 3, 1913, provides that raw skins shall be admitted duty free, but that "furs dressed on the skin, not advanced further than dyeing, shall be taxed 30 per centum ad valorem; plates and mats of dog and goat skins, 10 per centum ad valorem; manufactures of furs, further advanced than dressing and dyeing, when prepared for use as material, joined or sewed together, including plates, linings, and crosses, except plates and mats of dog and goat skins, and articles manufactured from fur not specially provided for in this section, 40 per centum ad valorem; articles of wearing apparel of every description partly or wholly manufactured, composed of, or of which hides or skins of cattle of the bovine species, or of the dog or goat, are the component material of chief value, 15 per centum ad valorem; articles of wearing apparel of every description partly or wholly manufactured, composed of or of which fur is the component material of chief value, not specially provided for in this section, 50 per centum ad valorem; furs not on the skin prepared for hatters' use, including fur skins carroted, 15 per centum ad valorem."

Because there is no duty collected by the British Government on dressed skins or manufactured furs shipped into England, the impression is rather general that the Canadian furriers are not obliged to pay a tax on the dressed skins and furs imported by them from the Mother Country. As a matter of fact the Canadian Government imposes a duty of twenty-five per cent. on all manufactured furs, and seventeen and one-half per cent on all dressed skins brought into the Dominion from other parts of the British Empire. The tax on dressed skins shipped into Canada from foreign countries is twenty per cent, and on manufactured furs it is thirty per cent. Raw skins are admitted free. Germany, like England, admits manufactured furs, and dressed as well as raw skins duty free, but France and Russia now impose a tariff on dressed skins and manufactured furs.

IMPORTS AND EXPORTS.

The total value of the dressed skins and manufactures thereof shipped into the United States from foreign ports during the calendar year 1912 was $7,973.480, and the value of the raw skins imported that year was $17,708.663. The receipts from Germany, were valued at $8,863,991; from England, at $4,652,687; from France, at $3,617,752; from Belgium, at $2,486,246; and those from all other countries at $6,051,358.

The value of the domestic furs and skins exported during the same year was $16,297,938; fifty per cent of the total going to England and her possessions, forty per cent to Germany, and ten per cent to various other countries.

RESTRICTIONS.

Full particulars as to the restrictions placed upon the slaughter of fur seals, and the introduction of fur seal skins and garments into the United States from foreign parts, appear in the chapter on Fur Seals. The government also regulates the killing of arctic foxes on the Islands in the Bering Sea, and from time to time has established closed seasons for the protection of the beaver and other animals to secure the conservation of some of the valuable North American fur producers; and a number of states have established closed seasons for different animals.

The Russian government has recently declared a closed season for Sables in Siberia, the Chinchilla is being protected in Bolivia, and restrictions have been placed upon the slaughter of Sea Otters, and various other valuable fur producers in different parts of the world that have been decreasing in numbers because of a steadily increasing demand for their skins. On the other hand the restrictions placed upon the killing of a number of other animals have been removed because of the rapidity with which the species have increased under a protective policy.

The Canadian authorities were among the first to establish closed seasons for the conservation of fur bearing animals that were threatened with extermination, and Otter, Beaver, Fisher, Sable and Mink can only be taken at certain seasons in most of the provinces of Canada.

In Alaska south of 62° north latitude the Brown Bear can be hunted only from October 1 to June 30.

In Iowa the open season for Beaver, Otter, Mink and Muskrats is from November 1 to April 30. In Kentucky the closed season for Otter, Beaver, Mink and Raccoon is from March 1 to November 15.

In Maine, Mink, Sable and Fischer can be taken from October 15 to April 30, but Muskrats are protected until December 1.

The open season in Michigan for Otter, Fisher and Sable is from April 30 to November 15, and for Mink, Raccoon, Skunk and Muskrat from September 1 to November 1.

In Minnesota, Mink and Beaver can be taken only from November 15 to April 15.

The closed season for Bear in Mississippi is from November 15 to March 1.

The catching or killing of Beaver and Otter is prohibited in Nebraska, North and South Dakota, Utah and Vermont.

Sable, Fisher and Otter can be hunted in New Hampshire from October 15 to March 31.

No one is allowed to kill or capture Beaver in New York state, and Mink, Skunk and Muskrats can be taken in that state only from October 15 to April 30.

Pennsylvania has a closed season for Bears from March 1 to October 1, and protects the Beaver at all seasons.

In Wisconsin the closed season for Otter is from February 15 to March 1; for Fisher, Sable and Mink from March 1 to November 1; and for Beaver from May 1

ENGLISH	FRENCH	GERMAN	SPANISH
Aard-wolf	Loup de terre	Erd Wolf	Lupi tierra
*Alaska Sable	(Natural Skunk)		
Alpaca	Alpaga	Alpaka	Alpaca
Angora	Angora	Angora	Angora
Antelope	Gazelle	Antilope	Antilope
Ape	Singe	Affe	Mono
Astrachan	Caracul	Astrachan	Astrachain
Aurochs	Boeuf sauvage	Auer-ochs	Uro
Axis	Daim de Bengale	Axis	Axis
Azara's Dog	(Sometimes called Pampas Fox)		
Baboon	Babouin	Pavian	Cinocefalo
Badger-American	Blaireau americain	Amerikanisher Dachs	Tejon de America
-Common	Blaireau commun	Europaisher Dachs	Tejon comun
-Honey	Blaireau miel	Honigsdachs	Tejon de miel
-Sand	Blaireau sable	Sanddachs	Tejon de arena
-Javanese	Blaireau	Stinkdachs	Tejon
*Baltic Seal	(Coney or Nutria—Plucked and Dyed Seal Brown)		
Bandicoot (Indian Rat)	Rat d'Indien	Malabar-ratte	Ratte de India
Ban Kaos	(Chinese Mouflons)		
Bassarisk	Basarius	Katzenfrett	Basarius
Bison-American	Bison	Bison	Bisonte
-European		Wisent	
Bay Lynx	(American Wild Cat)		
Bear-Black	Ours noir	Schwarzer Bär (Baribal)	Orso negro
-Brown	Ours brun	Brauner Bär	Orso pardo
-Grey	Ours gris	Grisbär	Orso gris
-Grizzly	Ours grisatre	Grizzly-Bär	Orso gris de America
-Himalayan	Ours d'Himalaya	Himalayishe Bär	Orso de Himalaya
-Polar	Ours blanc	Eisbär	Orso blanco
-Russian	Ours d'Russe	Russicher Bär	Orso de Rusio
-Sloth	Ours jougleur	Lippenbär	Orso
-White	Ours blanc	Eisbär	Orso blanco
*Bear Cat	(Benturong)		
Beaver	Castor	Biber	Castor

*Trade Names.

ENGLISH	FRENCH	GERMAN	SPANISH
Beaver Rat	Rat castor	Schwimmratte	Ratte de castor
Black Bock	Daim noir	Schwarzbock	
*Black Marten		(Opossum, Raccoon or White Skunk Dyed Black)	
Blessbok		Bläszbock	
Bobac		(Russian Marmot)	
*Breitschwanz		(Still-born Persian Lamb)	
Broadtail	Breitschwanz	Breitschwanz	Caraculi
*Brook Mink		(Natural Muskrat)	
Buffalo	Buffle	Büffel	Bufalo
*Buffalo		(American Bison)	
*Burun Duchy		(Siberian Chipmunk)	
*Bush Cat		(Chinese Civet and other Asiatic and African Cats)	
*Calabar		(Former trade name for Squirrel)	
Calf	Faon	Kalb	Ternera
Camel-Bacterian	Chameau	Kamel	Camello
-Dromedary	Dromadaire	Dromedar	Dromedario
*Canada Lynx		(American Wild Cat)	
Cat-Lynx		(American Wild Cat)	
Cat-Common		(American Wild Cat)	
Caracal	Caracal	Karakal	Caracal
*Caracul		(French name for Astrachan)	
Caribou	Caribou	Karibu	Caribu
Cats	Chats	Katzen	Gatos
Cat-Black	Chat noir	Schwarzer Katze	Gato negro
-Bush		Steppenkatze	
-Caffer	Chat d'Afrique	Kaffernkatze	
-Chaus		(Swamp Lynx)	
-Civet	Chat civette	Civet oder Lyrakatze	Gato-civet
-Desert		Wustenkatze	
-Domestic	Chat commun	Gemeiner Katze	Gato comun
-European Wild	Chat sauvage	Wildkatze	Gato monteo
-Golden	Chat	Goldkatze	
-House	Chat chateau	Housekatze	
-Jungle		(India Leopard Cat)	

ENGLISH	FRENCH	GERMAN	SPANISH
Cat-Leopard	Chat leopard	Leoparden Katze	Gato leopardo
-Lynx	Chat-cervier	Luchskatze	Gato-lince
-Mottled	Chat	Scheckenkatze	
-Pampas	Chat	Pampaskatze	
-Panther	Chat pantere	Pantherkatze	Gato pantera
-Tabby	Chat	Cyperkatze	Gato
-Tiger	Chat tigre	Tigerkatze	Gato tigre
-Tortoise shell	Chat	Shildpatt Katze	
*Native Cat	(Dasyure)		
Chamois	Chamois	Gemse	Gamuza
Chimpanzee	Chimpanzee	Schimpanse	Troglodita negro
Chinchilla	Chinchille	Chinchilla	Chinchilla
Chinchilla-Bastards	Chinchille de la Plata	Bastard Chinchilla	Chinchilla
*Chinchilla Squirrel	(Whole Squirrels Dyed to Imitate Chinchilla)		
Chinchillones	Chinchillone	Chinchillone	Chinchillone
*Chinese Lynx	(Dyed Goat or Dog)		
*Chinese Mouflon	(Chinese Goat Skins Dehaired)		
*Chinese Stone Marten	(Pahmi)		
*Chinola	(Squirrel Backs mottled to imitate Chinchilla)		
Chipmunk-American	Ecureuil de terre	Erdhornchen	Ardilla terrestre
Chitah (Cheetah)	Guepard	Jagdleopard	Leopardo cazador
Civet-African	Civette	Zibetkatze	Gato de algalia
-Chinese	Civette d'Chine	Chinesische Zibetkatze	Gato de China
*Civet Cat		(Little Striped Skunk)	
Clouded Leopard	Leopard nebuleux	Nebelpanther	Leopardo sombrio
Coati	Coati	Nasenbär	Coati
Colobus		(See Monkey)	
Colt (Pony)	Poulain	Füllen (Fohlen)	Potro (Poledri)
Cony (Rabbit)	Lapins	Kaninchen (Kanin)	Conejo (Conigli)
*Cony-leopard	(Cony marked to Imitate Leopard)		
*Cony-mole	(Cony sheared and Dyed Mole Color)		
*Cougnar	(Canadian Puma)		
Coyote	Loup	Prairie-wolf	Lobo de las praderas
Crimmer	Krimmer-gris	Graue Krimmer	Crimeri-grige

ENGLISH	FRENCH	GERMAN	SPANISH
Dalgelty		(Parameles)	
Danada		(Pinhead Persian)	
Dasyure (Spotted Cat of Australia)		Beutelmarder	
Deer	Daim (Chevreuils)	Hirsch (Reh)	Venado (Cervi)
-Fallow	Daim	Damhirsch	Gamo
-Red	Bete Fauve	Edel Hirsch	Ciervo comun
Desman	Desman	Russelmaus	Raton almizero
Dingo		(Australian Wild Dog)	
Dog-Domestic	Chiens	Hunde	Perro (Cani)
Dog-Raccoon	Chien marmotte	Viverrenhund	
Dog-Wild	Chien sauvage	Wildhund	Cani-monteo
Dog-faced Monkey		(Baboon)	Cani-marmota
Dormouse	Loi	Bilch (Siebenschläfer)	Liron
Elk	Elan	Elch (Elentier)	Anta
Ermine	Hermine	Hermelin	Armino (Ermallini)
Eyra	Eyra	Eyra	Eyra
Fenec		(African Kit Fox)	
Ferret	Furet	Frettchen (Frett)	Huron
*Florida Mink		(Mink Dyed Marmot)	
Fossane		(Fossa)	
Fisher	Pecan	Virginische Iltis	Puzzole de America
Fitch	Putois	Iltis	Puzzole
*Foal Leopard		(Pony Dyed and spotted)	
Foxes	Renards	Fuchse	Zorro (Volpi)
Fox-Arctic or Blue	Renard blue	Blaufüchs	Volpi azul
-Black	Renard noir	Schwarze Füchs	Volpi negro
-Cossac		(Asiatic Kit Fox)	
-Cross	Renard croix	Kreuzfüchs	Volpi cruz
-Common	Renard commun	Gemeiner Füchs	Volpi comun
-Grey	Renard gris	Grisfüchs	Volpi gris
-Kit	Renard prairie	Kitfüchs	Volpi del pradera
-Red	Renard rouge	Rotfüchs	Volpi rubio
-Silver	Renard argenti	Silberfüchs	Volpi plateado
-Polar or White	Renard blanc	Polarfüchs	Volpi blanco

ENGLISH	FRENCH	GERMAN	SPANISH
Fox-*Pampas	(Azara 's Dog)		
-*Cape	(Black Back Jackal)		
-*Japan	(Raccoon Dog)		
-*Argente	(White Fox Dyed with Tips left White)		
-*Black Alaska	(Red Fox Dyed Black)		
-*Blue White	(White Fox Dyed Blue)		
-*Champagne	(White Fox Tinted Champagne Color)		
-*Iceland	(Iceland Lamb with Curl Taken Out)		
-*Pointed	(Red Fox Dyed and Pointed with White Hairs)		
-*Sable	(Red Fox Dyed Sable Color)		
-*Sea	(Raccoon Dog)		
-*Sitka	(Red Fox Dyed Smoke Black)		
-*Taupe	(Red Fox Dyed Mole Color)		
*Fi Fu	(Chinese for Flying Squirrel)		
*Fox-nosed Monkey	(Lemur)		
*Fox Raccoon	(Bassarisk)		
*French Leopard	(Hares Dyed and Marked)		
*French Lynx	(Wild Cat or Dyed Wolf)		
*French Seal	(Cony Clipped and Dyed Seal Color)		
*French Wolf	(Siberian Goat Dyed)		
Gayal	Gayal	Gayal	Gayal
Gaur	Gaur	Gaur	Gaur
Gazelle	Gazelle	Gazelle	Gacela
Genet	Genette	Ginsterkatze	Gineta
Gibbon	Gibbon	Gibbon	Gibon
Glutton	Glouton	Vielfrass	Tragon (Chiottoni)
Gnu	Gnu	Gnu	Gnu
Guereza	(See Monkey)		
Goats	Bouc (Chevre)	Ziegen	Cabra (Capre)
-Angora	Bouc angora	Angoraziege	Cabra angori
-Cape	Bouc cap	Kap-ziege	Cabra
-Cashmere	Bouc cashmere	Kashmirziege	Cabra Kashmir
-China	Bouc de Chine	Chinesische Ziege	Cabra de Chini
-Common	Bouc commun	Gemeine Ziege	Cabra comun

ENGLISH	FRENCH	GERMAN	SPANISH
Goat-Ibex	Bouquetin	Steinbock	Ibice
-Italian	Bouc d'Italien	Italienische Ziege	Cabra de Italia
-Mongolian	Mongoliens	Mongolische Ziege	Tibetini
-Rocky Mountain			
-Russian			
-Tibet		Tibetziege	
*Golden Squirrel		(Asiatic Chipmunk)	
Gopher	Gaufre	Backenhörnchen	Geomis
Gorilla	Gorilla	Gorilla	Gorilla
Grebe	Grebe	Griber	Grebbe
Grison	Grison	Grison	Grison
Guanaco	Guanako	Guanaco	Huanako
Hairseal	Phoques	Seehunde	Foche
Hamster	Hamster	Hamster	Hamster
Hares	Lievre	Hasen	Liebre (Lepri)
*Hudson Seal	(Muskrat—plucked, sheared close and dyed Seal Brown)		
Huli or Vuli		(Chinese for Fox)	
Huran		(Corean for Tiger)	
Hyæna-Brown	Hyene	Hyane	Hiena
Ibex	Bouquetin	Steinbock	Ibice
Ichneumon	Ichneumon	Pharaonsratte	Icneumon
Istatsi		(Japanese Mink)	
Jackal	Chacal	Schakal	Chacal (Sciacalli)
Jaguar	Jaguar	Jaguar	Jaguar
Jaguarondi	Jaguarondi	Yaguarondi	Yaguarondi
*Japanese Fox		(See Raccoon Dog)	
*Jungle Cat		(Swamp Lynx)	
Kitzenu		(Japanese for Fox)	
Kangaroo	Kanguroo	Känguruh	Cangaru
Kangaroo-Squirrel		Beuteleichorn	
Kangaroo-Rat		Beutelratte	
Koala	Koala	Barenbeutler	Koala
Kid		Zickel	
Kinkajon	Kinkajou	Wickelbär	Kinkajou

ENGLISH	FRENCH	GERMAN	SPANISH
*Kittrass		(Muskrat plucked, sheared, dyed mole)	
Kolinsky	Collinsky	Erdmarder (Feurmarder)	Collinski
Kuma		(Japanese for Bear)	
Lambs	Agneau	Lamme	Cordero (Agnelli)
Largotis		(See Chinchilla)	
Lao Fu or Lao Hu		(Chinese for Tiger)	
Lemming	Lemming	Lemming (Bellichmaus)	Turon de Noruega
Lemur	Lemurien	Halbaffe	Lemur
Jama Jum		(Japanese Wolf)	
Kju		(Chinese for Dog)	
Kusu		(Celebes Opossum)	
La Long		(Chinese Wolf)	
Leopards	Leopards	Leoparden	Leopardo
Leopard-Clouded	Leopard nebuleux	Nebelpanther	Leopardo sombrio
-Hunting		(Chitah)	
-Snow		(Ounce)	
Leon		(Mexican Puma)	
Linsang	Linsang	Sleichkatze	Lurang
Lion	Lion	Löwe	Leon
Llama	Mouflon	Lama (Mouflon)	Llama (Muffloni)
Lynxes	Lynx	Luchse	Lince
-American	Loup cervier	Luchs	Lince
-Bay	Chat cervier	Luchskatzen	Lince gato
-Caracal	Caracal	Wüstenluchs	Lince caracal
-European	Lynx mouchete	Gemeiner Luchs	Lince comun
-Pardine		Pardelluchs	
Lynx Cat		(American Wild Cat)	
Malacca Weasel		(Rasse)	
Mami		(Japanese for Badger)	
Mangabey		Mohren-affe	
Mao		(Chinese for Cat)	
Marmoset		Seidenäffchen	
Marmot	Marmotte	Murmeltier (Murmal)	Marmota
Marmot Mink		(Marmots Dyed and Striped)	

ENGLISH	FRENCH	GERMAN	SPANISH
Marten	Martre	Marder	Marta
-Baum (Pine)	Martre de Prusse	Baumarder (Edelmarder)	Martore
-Beech (Stone)	Fouine	Steinmarder	Foine
Minks	Vison	Nörz (Nerze)	Vison (Visoni)
Mole	Taupe	Maulwurf	Topo (Talpi)
*Moline	(Cony Sheared and Dyed Mole)		
*Mountain Cat	(Bassarisk)		
Mountain Lion	(Western States Puma)		
Monkeys	Singe	Affen	Mono (Scimmie)
Monkeys-Black	Singe noir	Scheitleaffe	Mono negro
-Blue	Singe bleu	Guereza	Mono azul
-Grey	Singe gris		Mono gris
-Green	Singe vert		Mono verde
-Moustache	Singe Moustache	Schnurrbart-affe	Mono mustachos
-Vervet	Singe-	Meerkatze	Mono-
-Wanderoo	Wanderu	Wanderu	Uanderu
-Abyssinian	Singe-	Kragenaffe	Mono de Africa
-Red	Singe-rouge	Rotaffe	Mono encarnado
Moose	Daim americain	Elentier	Alce
Mouflon	Mouflon de Chine	Mufflon (Mouflin)	Verraco (Mufflien)
Mungoose	Mungoos	Munguste	Mangosta
Musk Ox	Boeuf musque	Schafochse (Bisamstier)	Buey muschiati
Muskrat	Ratmusque	Bisamratte	Almizclera (Ratte Muschiati)
*Native Cat	(Dasyure)		
*Near Seal	(Cony Sheared close and Dyed Seal Color)		
Neko	(Japanese for Cat)		
Nutria	Ratgondin	Schweif-biber (Nutrea)	Coipu (Piel del coipu)
Ocelot	Ocelot	Ozelot	Ocelote
Opossum	Opossum Americain	Beutleratte	Oposs de America
-Australian	Opossum de Australie	Fuchskusu	Oposs de Australia
*Opossum-Skunk	(Opossum Dyed Skunk Color)		
Otters-Common	Loutre de pays	Landotter	Nutria comun
-American	Loutre d'Amerique	Canadischer Otter	Nutria de Canada
-Asiatic	Loutre d'Asia	Bagdadotter	Nutria de Asia

ENGLISH	FRENCH	GERMAN	SPANISH
Orang-outang	Orang-Utang	Orang-Utan	Orang-utan
Ounce	Once	Irbis	Onza
Ox	Boeuf	Ochs	Buey
Paddy Melon		(Bridled Kangaroo)	
Paguma	Paguma	Paguma	Paguma
Pahmi		(Chinese Stinking Badger)	
Palm Cat		(Paradoxure)	
Panda	Panda	Katzenbär	Panda
Panther (Puma)	Panthere	Panther	Pantera
Paradoxus	Paradoxure	Palmenroller	Paradoxure
Parameles	Parameles	Beuteldachs	Parameles
Persian Lamb	Astracan (Persianne)	Persianer	Astracani di Persia
Perwitsky	Putois-madre	Tigeriltis	Veso tigre
Phalanger	Phalanger	Kusu	Phalanger
Platybus	Ondatras	Schwabeltiere	
Polecat	Putois	Iltis	Veso
Pony (Colt)	Poulain	Kirgisenpferd	Potro (Poledri)
Prairie Dog	Marmotte American	Präeriehund	Marmota
Puma	Puma	Kuguar	Puma
Pony-Russian	Lapin	Kaninchen (Kanin)	Conejo (Conigli)
Raccoon Dog	Chien marmotte	Viverrienhund	Cani marmota
Rasse	Rasse	Rasse	Rasse
Raccoon	Marmottes	Waschbär (Schuppe)	Coati
Rat Coypu		(See Nutria)	
Ratel	Ratel	Ratel	Ratel
Reindeer	Renne	Renntier	Reno (Pellidi Renner)
Ringtail		(Applied to Bassarisk and Cook's Phalanger)	
*River Mink		(Muskrat Striped like Mink)	
*Russian Leopard		(Hare Dyed and Marked like Leopard)	
*Russian Lynx		(Hare Dyed Black)	
*Russian Wolf		(Siberian Dog Dyed)	
Sable-Hudson's Bay	Martre de Canada	Amerikanischer Zobel	Martore Canada
Sable-Russian	Zibelline	Zobel	Cebellina
-Tartar		(See Kolinsky)	

ENGLISH	FRENCH	GERMAN	SPANISH
San Yang		(Chinese for Domestic Goat)	
Sea Bears		(Fur Seals)	
Sea Dogs		(Hair Seals)	
Sea Lions		(Eared Hair Seals)	
Seals (Eared-Hair)	Loup marin	Pelzseehunde	Foca
Seals (Eared-Fur)		Seelöwen	
Seals (True)	Veau marin	Haarseehunde	
*Seal-Baltic		(Nutria Plucked and Dyed Seal Color)	
* -French		(Cony Plucked, Clipped and Dyed Seal Color)	
* -Hudson		(Muskrat Plucked, sheared and Dyed Seal Color)	
*Sea Fox		(Raccoon Dog)	
Seedrache		(Chinese for Sea Otter)	
Sea Otter	Loutre de Kamtchatka	Seeotter	Loutre Camschiatka
Serval	Chat tigre	Tigerkatze	Gato ategrado
Sheep	Mouton	Schaf	Carnero
Skunk	Skunk	Skunk	Mofeta (Skunk)
-Little Striped	Chat civette	Lyrakatze	Gato civeta
*Skunk Opossum		(Opossum Dyed Skunk Color)	
*Skunk Raccoon		(Raccoon Dyed Skunk Color)	
*Siberian Raccoon		(Various imitations of Raccoon)	
*Skunk Raccoon		(Raccoon Dyed skunk color)	
Slink Lamb	Agneaux Slink	Slink	Slink
*South American Beaver		(Natural Nutria)	
Spermophile	Suslik	Leopardenziesel	Citelo
Spring Bock	Sortir daim	Springbock	Espringbock
Squirrels-Flying		Flughörnchen	
-Ground		(Spermophiles)	
-Rock		(Chipmunks)	
-Tree	Petit gris	Eichhörnchen (Feh)	Ardilla (vajo)
*Squirrel-Chinchilla		(Squirrel Dyed to imitate Chinchilla)	
*Squirrel-Golden		(Asiatic Chipmunk)	
*Squirrel-sable		(Squirrel Dyed Brown and Striped)	
Stoat	Hermine (Roselet)	Hermelin	Armino
Suslik	Suslik	Gemeiner Ziesel	Citelo

ENGLISH	FRENCH	GERMAN	SPANISH
Sze Hue		(Chinese for Badger)	
Tanuki		(Japanese for Raccoon)	
Tapir	Tapir	Tapir	Tapir
Tasmania Devil		Teufel	
Tasmanian Wolf		Beutelwolf	
Tayra	Tayra	Tayra	Tayra
Teh Mao		(Chinese for Wild Cats)	
Teladu		(India Badger)	
Ten		(Japanese Marten)	
Tha		(Chinese for Otter)	
Tibet	Mongolie	Tibet	Tibetieni
Tiger	Tigre	Tiger	El Tigre
Tracker		(See Ichnueman)	
Vicuna (Vicugna)	Vigogne	Vicunna	Vicuna
Viscacha	Viscacha	Wollmaus (Biscacha)	Viscacha
Wallaby	Wallaby	Kleineres Känguruh	Wallaby
Walleroo	Walleroo	Walleroo	Walleroo
Wapiti	Le cerf	Canadischer Hirsch	Ciervo del Canada
Weasel	Belette	Wiesel	Comadreja
Who Long		(Chinese Weasel or Mink)	
Wolves	Loup	Wölf	Lobo (Lupi)
Wuychuchol		(Russian Desman)	
Wolverine	Gloutton	Vielfrass	Volverena (Chiottoni)
Wolf-Albino		(Scandinavia and Far North)	
-Black		(Russia and Tibet)	
-Brown		(France)	
-Grey or Timber		(North American, Europe and Asia)	
-Fulvous		(South Eastern Europe)	
-Prairie		(See Coyote)	
Wombat	Wombat	Wombat	Fascolomo
Woodchuck	Marmotte Americain	Virginisches Murmeltier	Marmota grande de America
Yak	Yack	Yack	Yak
Ya Mao		(Chinese for Civet Cat)	
Zebra	Zebre	Zebra	Cebra
Zorilla	Zorilla	Kapskunk	Zorilla

CLASSIFICATION.

ALL the individuals of any particular kind constitute a *Species;* closely allied species are assigned to a common *Genus;* nearly-related genera are considered as being of the same *Family;* families having a general similarity in external appearance are treated as belonging to the same *Order;* orders that are alike in some important character are placed together in a *Class;* and, finally, the three classes of animals possessing a Vertebra are grouped in one *Sub-Kingdom* of the *Animal Kingdom;* the other sub-kingdom being composed of the seven classes of Invertebrates:

Protoza—Cell organisms, such as microbes, parasites, etc.
Cœlenterata—Sea Anemones, Medusas, Coral, Sponges, etc.
Echinodermata—Sea Urchins, Sea Eggs.
Vermes—Worms.
Molluscoidea—Brachiopods, like snails, etc.
Mollusks—Bivalves—Oysters, Clams, etc.
Anthropoda—Insects, Spiders, Scorpions, and Crustaceans like Crabs, etc. This is the most advanced class of the Invertebrata, and the largest class in the Animal Kingdom, including over 200,000 species.

All fur-bearing animals belong to the class Mammalia, of the sub-kingdom Vertebrata, which includes over 3,250 species, grouped under 1,000 genera, into 150 families, and eleven orders. The following charts and tables show the proper grouping, and the relations and affinities each to each, of the different species, which come within the scope of this work.

In the Classification Chart and Alphabetical List of Species the accepted technical designation of the type species alone is generally given, but in some cases the number of different varieties, or acknowledged sub-species, of the animal is indicated by the figures in parenthesis. The alphabetical list gives the technical designation of each variety of the different species of the bear, so that the reader may understand the apparent confusion of terms, where one writer refers to the Grizzly as Ursus-horribilis, and another speaks of the varieties of that animal found in Alaska and Mexico as Ursus-alacensis and Ursus-horriaeus respectively.

SUB-KINGDOM	CLASS	ORDER
Vertebrata	Sauropsida—Birds and Reptiles.	
	Ichthyopsida—Amphibians and Fish.	
	Mammalia	1. PRIMATES—Man, and manlike mammals, such as apes, baboons, lemurs, monkeys, etc.; sometimes called quadrumana because of their ability to use both back and front feet as hands.
		2. Chioptera—Mammals possessing the power of true flight—Bats.
		3. INSECTIVORA—Insect-eating mammals, like the Shrew, Mole, and Hedgehog.
		4. CARNIVORA—Mammals who subsist entirely, or in part, on the flesh of other Vertebrates. This order is divided into two sub-orders; the fin-footed water carnivore, the seals and walruses, being known as Pinnipedia; and the land carnivore as Fissipedia.
		5. UNGULATA—Hoofed mammals, nearly all of whom are herbivorous ruminants.
		6. Sirenia—Purely aquatic mammals—Manatis, Dugongs, Northern Sea Cows.
		7. Cetacea—Fish-like formed mammals—Whales, Porpoises, and Dolphins.
		8. RODENTIA—Mammals who gnaw their food; like Rats, Squirrels, Rabbits, and Beavers.
		9. Edentata—Mammals without front teeth, and in some cases entirely toothless; like Ant-Eaters, Sloths, Pangolins, and Armadillos.
		10. MARSUPIALIA—Pouched Mammals, Implacentals; like the Kangaroo and Opossum.
		11. Monotremata—Egg-laying Mammals, like the Australian Duckbill and Echidnos.

ORDER	FAMILY	GENUS—SPECIES	COMMON NAME
Carnivora-(Fissipedia)	Bear (Ursidæ)	Ursus-americanus (various)	Bear-Black
		-arctos (various)	-Brown or Cinnamon
		-horribilis (various)	-Grizzly
		-torquatus	-Himalayan
		-malayanus	-Sun
		-maritimus	-Polar or White
		Melursus-ursinus	-Sloth
		Ursus-ornatus	-Spectacled
	Cat (Felidæ)	Felis-various species	Cats-Bush
		-various species	-Desert
		-domestica	-Domestic
		-domestica	-House
		-temmincki	-Golden
		-various species	-Jungle
		-various species	-Pampas
		-various species	-Panther
		-various species	-Tiger
		-catus	-Wild-European
		Felis-onca	Jaguar
		Felis-yaguarondi	Jaguarondi
		Felis-pardus (various)	Leopard
		-nebulosa (various)	-Clouded
		-uncia	-Snow
		Felis-leo	Lion
		Felis-canadensis (various)	Lynx-American
		-rufa (various)	-Bay or Canada
		-lynx (various)	-Common European
		-pardina	-Pardine
		-chaus	-Swamp
		Felis-pardalis	Ocelot
		Felis-uncia	Ounce
		Felis-concolor	Puma
		Felis-serval	Serval
		Felis-tigris	Tiger

ORDER	FAMILY	GENUS—SPECIES	COMMON NAME
Carnivora (Fissipedia)	Civet (Viverridæ)	Viverra-civetta	Civet-African
		-zibetha	-Chinese
		Cryptoprocta-ferox	Fossane of Madagascar
		Genetta-vulgaris	Genet-Common
		-tigrina	-Blotched
		Herpestes-ichneumon	Mungoose-Egyptian
		Nandinia-binotata	Palm Civet-African
		Paradoxurus	-Asiatic
		Viverra-Malaccensis	Rasse
	Dog (Canidæ)	Canis-antarticus	Dog-Antarctic
		-azaræ	-Azara 's
		-dingo	-Dingo
		-familiaris	-Domestic
		-deccanensis	-Indian Wild
		-jubatus	-Maned Wolf
		-procyonoides	-Raccoon
		-alpinus	-Siberian
		Canis-lagopus	Fox-Blue or Arctic
		-vulpes	-Common
		-fulvus	-Cross
		-virginianus	-Grey
		-velox	-Kit
		-fulvus	-Red
		-fulvus	-Silver
		-lagopus	-White or Polar
		Canis-aureus	Jackal
		Canis-lupus (various)	Wolf-European
		-pallipes	-Indian
		-latrans	-Prairie (Coyote)
		-lupus-occidentalis	-Timber
		-sinensis	-African
		-hyrophylax	-Japan
		-peninsula	-Patagonia

ORDER	FAMILY	GENUS—SPECIES	GROUP	COMMON NAME
Carnivora (Fissipedia)	(Proteleidæ)	Proteles-cristatus		Aard-wolf
	Hyæna (Hyænidæ)	Hyæna-brunnea		Hyaena-Brown
		-crocuta		-Spotted
		-striata		-Striped
	Raccoon (Procyonidæ)	Basaris-astuta		Bassarisk
		Nasua-nasica and -rufa		Coatis
		Cercoleptes-caudivolvulus		Kinkajou (Jupura)
		Aelurus-fulgens		Panda
		Procyon-lotor		Raccoon
		Procyon-cancrivorous		Raccoon-Crab-eating
	Weasel (Mustelidæ) Group 1—Marten " 2—Weasel " 3—Polecat " 4—Otter " 5—Badger " 6—Wolverine	Taxidea-americana	(5)	Badger-American
		Meles-leptorhynchus		-Chinese (Brock)
		-taxus		-Common (European)
		Mellivora-ratel		-Honey (Ratel)
		Meles-ankuma or -anacuma		-Japanese
		Mydaus-meliceps		-Malayan
		Meles-canescens		-Persian
		Arctonyx-collaris		-Sand (-Hog)
		Meles-leucurus		-White Tailed
		Mustela-erminea	(2)	Ermine
		Mustela-putorius-furor	(3)	Ferret
		Mustela-pennanti	(1)	Fisher
		Mustela-putorius-	(3)	Fitch or Fitchet
		Galictis-vittata	(2)	Grison
		Mustela-sibirica	(1)	Kolinsky or Tartar Sable
		Mustela-americana	(1)	Marten-American (H. B. Sable)
		-martes		-Baum (Pine)
		-flavigula		-Indian
		-melanopus		-Japanese
		-foina		-Stone (Beech)

ORDER	FAMILY	GENUS—SPECIES	GROUP	COMMON NAME
Carnivora (Fissipedia)	Weasel (Mustelidæ)	Mustela-vison	(1)	Mink-American
		-stegmanni		-Chinese
		-lutreola		-European
		-itatsi		-Japanese
		-lutreola		-Russian
		Lutra-canadensis (various)	(4)	Otter-American
		-braziliensis		-Brazilian
		-vulgaris (various)		-Common (European)
		Putorius-sarmaticus	(3)	Perwitsky
		Mustela-eversmanni	(3)	Polecat-Siberian (Russian)
		Mustela-americanus	(1)	Sable-Hudson's Bay
		-zibellina		-Russian
		Latax-lutris	(1)	Sea Otter
		Mephitis-mephitica	(3)	Skunk
		-putorius		-Little Striped
		Mustela-macrura		-Mexican (long tail)
		Conepatus-mapurito		-S. Amer. (white back)
		Mustela-erminea (various)	(2)	Stoat (greater Weasel)
		Galictis-barbara	(2)	Tayra
		Mustela-vulgaris	(2)	Weasel
		Pœcilogale-albinucha		Weasel-South African
		Gulo-luscus	(6)	Wolverine (Glutton)
Carnivora (Pinnipedia)	Sea Bear (Tricophocinæ-Otariidæ)	Callorhinus-ursinus		Alaska Fur Seal
		Arctocephalus-pusilla		Cape " "
		Arctocephalus-falklandicus		Cape Horn " "
		Callorhinus-ursinus		Copper Island " "
		Callorhinus-ursinus		Japanese Fur Seal
		Arctocephalus-falklandicus		Lobos Island " "
		Callorhinus-ursinus		Robben " " "
		Arctocephalus-australis		Shetland " "
		Callorhinus-ursinus		Victoria " "

ORDER	FAMILY	GENUS— SPECIES	COMMON NAME
Carnivora (Pinnipedia)	Sea Lion (Ulophocinæ-Otariidæ)	Zalophus-lobatus	Australian Hair Seal
		Zalophus-californianus	Californian ‘‘ ‘‘
		Eumatropias-stelleri	Northern ‘‘ ‘‘
		Otaria-hookeri	Hooker's ‘‘ ‘‘
		Otaria-jubata	Patagonia ‘‘ ‘‘
	True Seal (Phocidæ)	Phoca-vitulina	Common Hair Seal
		Crystaphora-cristata	Crested ‘‘ ‘‘
		Machrorhinus-leoninus	Elephant ‘‘ ‘‘
		Phoca-grœnlandica	Greenland ‘‘ ‘‘
		Halichœrus-grypus	Grey ‘‘ ‘‘
		Ogmorhinus-leptonyx	Leopard ‘‘ ‘‘
		Pagomys-fœtida	Ringed ‘‘ ‘‘
		Leptonychœtus-weddelli	Weddell's ‘‘ ‘‘
Insectivora (Insect Eating Mammals)	Desman (Myogalidæ)	Myogale-moschata	Desman
		Myogale-pyrenaica	-Pyrenean
	Mole (Talpidæ)	Scalops-aquaticus	Mole-American
		Talpa-europæa	-European
Marsupialia (Pouched Mammals)	Bandicoot (Peramelidæ)	Perameles-	Bandicoot
	Dasyure (Dasyuridæ)	Dasyurus-viverrinus	Dasyure-Common
		-maculatus	-Spotted-tail
		Thylacinus-cynocephalus	Tasmanian Wolf or Devil
		Phascolarctus-cinereus	Koala (Australian Bear)
	Phalanger (Phalangeridæ)	Phalangista-maculatus	Cuscus
		Phalangista-cooki	Ring Tailed Opossum
		Trichosurus-vulpecula	Phalanger-Common (Aust. Oposs.)
		Petauroides-volans	-Great, Flying
		Petaurus-sciureus	-Squirrel
		Petaurus-australis	-Yellow

GENUS	FAMILY	GENUS—SPECIES		COMMON NAME
Marsupialia (Pouched Mammals)	Kangaroo (Macropodidæ)	Macropus-melanops		Kangaroo-Black faced
		-erubesens		-Blue
		-giganteus		-Great
		-rufus		-Red
		Macropus-bennetii		Wallaby-Bennett's (Brush Kangaroo)
		Onychogale-frenata		-Bridled (Pedemelon)
		Petrogale-penicillata		-Common Rock
		Lagorchestes-leporoides		-Hare
		Onychogale-unguifera		-Nail-tailed
		Macropus-ruficollis		-Red Neck
		Macropus-brachyurus		-Short-tailed
		Macropus-walabutus		-Swamp
		Petrogale-xanthopus		-Yellow-footed Rock
		Macropus-robustus		Wallaroo
	Opossum (Didelphyidæ)	Didelphus-virginia		Opossum-American
		-americanus		-Brazilian
		-cooki		-Ringtail
		-cannia		-Rock
		Chironectes-minima		-Water
	Wombat (Phascolomyidæ)	Phascolomys-mitchelli		Wombat-Common
		-latifrons		-Hairy-nosed
		-ursinus		-Tasmanian
Monotremata (Egg Laying Mammals)	(Echidnidæ)	Echidnea-hystricx		Echidna
	(Ornithorhynchidæ)	Ornithorhynchus-anatinus		Platybus
Primates (Bimana)	Man (Hominidæ)	Homo-	(3)	Man
Primates (Quadrumana)	Ape (Simiidæ)	Anthropopithecus	(2)	Chimpanzee
		Hylobartes-	(5)	Gibbon
		Gorilla-savagei	(1)	Gorilla
		Simia	(4)	Orang-Utang

ORDER	FAMILY	GENUS—	SPECIES	COMMON NAME
Primates (Quadrumana)	Baboon	Cynocephalus-hamadryas	(6)	Baboon-Arabian (Sacred)
		-sphinx		-Guinea
		-babuin		-Yellow
		-porcarius		Chacma
		-leucophœus		Drill
		Theropithecus-gelada		Gelada
		Cynocephalus-marmon		Mandrill
	(Ceropithecidæ)	Cynopithecus-niger	(1)	Black Ape
	Old World Monkey	Ceropithecus-	(20)	Guenons (Common Monkeys)
		Semnopithecus	(12)	Langurs
		Macacus-	(8)	Macaques (Wanderoo)
		Cerocebus	(2)	Mangabeys
		Nasalis-larvatus	(1)	Proboscis Monkeys
		Colobus-guereza	(7)	Thumbless " (Abyssinian)
		-ursinius		" " (Black)
		-vellorosus		" " (White Thigh)
	American Monkey (Cebidæ)	Cebus-capucinus	(6)	Capauchin-Monkey (Sapajou)
		Mycetes-	(5)	Howling "
		Nycipithecus	(3)	Owl-faced " (Dourocoli)
		Pithecia	(6)	Saki "
		Ateles	(10)	Spider "
		Chrysothrix-sciurea	(3)	Squirrel "
		Callithrix	(5)	Titi "
		Uacaria	(3)	Ukari "
		Lagothrix	(1)	Woolly "
		Ereodes	(1)	Woolly Spider"
	Marmoset (Halpalidæ)	Halpale-jacchus	(8)	Ouistitis or Short Tusked
		Midas-	(4)	Pinché
		Midas-	(6)	Tamarin or Long Tusked

ORDER	FAMILY	GENUS—	SPECIES	COMMON NAME
Primates (Quadrumana)	Lemur (Lemuridæ)	Galago-	(7)	African Lemur
		Avalus-	(1)	Avalii (Woolly)
		Halpalemur-	(2)	Gentle Lemur
		Indris-	(1)	Indri (Short tail)
		Chirogaleus-	(5)	Mouse Lemur
		Propithecus-	(3)	Safikas (Long tail)
		Perodictus-	(2)	Slow Lemur-Africa (Pottos)
		Nycticebus or Loris	(2)	Slow Lemur-Asia (Loris)
		Lemur-	(10)	True Lemur
		Lepedolemur-	(2)	Weasel Lemur
Rodentia (Gnawers)	(Tarsiidæ)	Tarsius-spectrum	(1)	Tarsier
	(Chiromyidæ)	Chiromys (various)		Aye-Aye
	Beaver (Castoridæ)	Castor-canadensis		Beaver
	Chinchilla (Chinchilliæ)	Chinchilla-brevicaudata		Chinchilla
		-lanigera		Chinchilla Bastard
		Largidium-cuvieri		Chinchillone
		Largostomus-trichodactylus		Viscacha
	Hare (Leporidæ)	Lepus-timidus		Hare-Alpine
		-americanus		-American
		-braziliensis		-Brazilian
		-europæus		-Common
		-sylvaticus		-Grey or Wood
		-variabilis		-Mountain
		-glacialis		-Polar
		-campestris		-Prairie
		-cuniculus		Rabbit
	Dormouse (Myoxidæ)	Muscardinus-avellanarius		Dormouse-Common
		-nitela		-Garden
		-pictus		-Painted
		-glis		-Squirrel-tailed

ORDER	FAMILY	SUB-FAMILY	GENUS—SPECIES	COMMON NAME
Rodentia (Gnawers)	Rat and Mouse Tribe	(Muridæ)	Cricetus-frumentarius	Hamster
			Myodes-lemmus	Lemming
			Fiber-zibethicus	Muskrat
			Hydromys-chrysogaster	Beaver Rat
		(Geomyidæ)	Dipodomys-phillipsi	Kangaroo Rat
		(Octodontidæ)	Myopotamus-coypus	Nutria
	Squirrel (Sciuridæ)	(Tree)	Sciurus-carolinensis	Squirrel-Am. Grey
			-hudsonianus	-Am. Red
			-vulgaris	-European
			-pygerythrus	-Irawadi
			-biculor	-Malayan
			-palmarum	-Palm
		(Flying)	Sciuropterus-volucella	-American
			Pteromys-petaurista	-Mayalan
			Eupataurus-cinereus	-Woolly
		(Rock)	Tamias-striatus	Chipmunk-American
			-macrotus	-California
			-asiaticus	-Siberian (Asiatic)
		(Ground)	Spermophilis-tridecemlineatus	Spermophile-Leopard
			-grammurus	-Long eared
			Spermophilis-citillus	Suslik
		(Marmot)	Arctomys-marmotta	Marmot-Alpine
			-monax	-American (Woodchuck)
			-himalyanus	-Himalayan
			-pruinosus	-Hoary
			-flaviventer	-Rocky Mountain
			-bobac	-Russian
			Cynomys-ludovicianus	Prairie-Dog

ORDER	FAMILY	GENUS—SPECIES	COMMON NAME
Ungulata (Hoofed Mammals)	Antelope (Antelopinæ)	Hippotragus-niger	Antelope-Sable
		Tragelaphus-scriptus	-Harnessed
		Pantholops-hodgsoni	-Snow (Chiru)
		Antilope-cervicapra	Black-Buck
		Bubalis-albifrons	Bless-Bok
		Rupicapra-tragus	Chamois
		Pantholops-hodgsoni	Chiru
		Connochœtes-taurina	Gnu
		Antilocapra-americana	Prong-Horn
		Gazella-euchore	Spring Bock
	Camel (Camelidæ)	Lama-pacos	Alpaca
		Camelus-bactrianus	Camel-Bactarian
		-dromedarius	-Dromedary (Arabian)
		Lama-paco	Alpaca
		Lama-huanacus	Guanaco
		Lama-peruana	Llama
		Lama-vicugna	Vicuna
	Deer (Cervidæ)	Rangifer-grœnlandicus	Caribou
		Cervus-axis	Deer-East India (Axis)
		Cervus-dama	-Fallow
		Cariacus-macrotis	-Mule
		Cariacus-virginianus	-North American
		Cervus-elaphus	-Red
		Alces-machlis	Elk
		" "	Moose
		Rangifer-tarandus	Reindeer
		Cervus-canadensis	Wapiti
	Goat (Caprinæ)	Capra-angorensis	Goat-Angora
		-hircus	-Cape
		-chinensis	-China
		-lanigeri	-Cashmere

ORDER	FAMILY	GENUS—SPECIES	COMMON NAME
Ungulata (Hoofed Mammals)	Goat (Caprinæ)	Capra-hircus	Goat-Common
		-ibex	-Ibex
		-hircus	-Italian
		-mongolica	-Mongolian
		-hircus	-Norwegian
		“	-Russian
		“	-Siberian
		“	-Syrian
		-villanosa	-Tibet
	Horse (Equidæ)	Equus-caballus	Pony
		Equus-zebra	Zebra
	Musk Ox (Ovibromæ)	Ovibos-moschatus	Musk Ox
	Ox (Bovidæ)	Bos-depressicornis	Anoa
		Bos-primigenius	Aurochs (Wild Ox)
		Bos-americanus	Bison-American
		Bos-bonassus	-European
		Bos-caffer	Buffalo-African (Cape)
		Bos-bubalus	-Asiatic (Indian)
		Bos-pumilus	-Short Horned
		Bos-gaurus	Gaur
		Bos-frontalis	Gayal
		Bos-taurus	Ox-Domestic-Calf
		Haploceros-montanus	Rocky Mountain Goat
		Bos-grunniens	Yak
	Sheep (Ovinæ)	Ovis-aries (patyura)	Astrachan
		-patyura	Bokharan
		-aries (steatopyga)	Cape
		“ “	China
		-aries (patyura)	Crimea (Krimmer)
		“ “	Danada

ORDER	FAMILY	GENUS—SPECIES	COMMON NAME
Ungulata (Hoofed Mammals)	Sheep (Ovinæ)	Ovis-aries (steatopyga)	Iceland
		-aries	Merino
		-ammon	Mongolian
		-musimon	Mouflon
		-aries (patyura)	Persian
		“ “	Pinhead
		-aries	Russian
		“	Shetland
		-aries (patyura)	Shiraz
		-aries (steatopyga)	Slink
		-hogsoni	Thibet (Tibetan)
		-aries (patyura)	Ukrainer
	Tapir (Tapiridæ)	Tapirus-americanus	Tapir-American
		-Indius	-Malayan

NAME.		ORDER	FAMILY		GENUS—SPECIES
Aard-wolf		Carnivora	Proteleidæ	(Hyæna)	Proteles-cristatus
Alpaca		Ungulata	Camelidæ	(Camel)	Lama-pacos
Angora Goat		Ungulata	Caprinæ	(Goat)	Capra-hircus
Antelope-Indian		Ungulata	Antelopinæ	(Antelope)	Antilope cervicapra
-Sable		"	"	"	Hippotragus-niger
Ape		Primates	Simiidæ	(Ape)	(Various Genera)
"Ape"-Barbary		Primates	Ceropithecidæ	(Monkey)	Macacus-innuus
-Black		"	"	"	Ceropithecus
Astrachan		Ungulata	Ovinæ	(Sheep)	Ovis-aries (patyura)
Aurochs		Ungulata	Bovidæ	(Ox)	Bos-primigenius
Axis		Ungulata	Cervidæ	(Deer)	Cervus-axis
Baboon		Primates	Ceropithecidæ	(Baboon)	(Various Genera)
Baboon-Gelada		Primates	Ceropithecus	(Baboon)	Theropithecus gelada
-Golden		"	"	"	Papio-babuin
-Hamadryas		"	"	"	-hamadryas
Badger-American		Carnivora	Mustelidæ	(Weasel)	Taxidea-americana (2)
-Asiatic (Brock)		"	"	"	Meles-chinensis (14)
-European (Common)		"	"	"	Meles-taxus (1)
-Honey		"	"	"	Mellivora-ratel (2)
-Sand		"	"	"	Arctonyx-collaris
-Stinking		"	"	"	Mydaus-meliceps (2)
Bandicoot		Marsupialia	Peramelidæ	(Bandicoot)	Perameles
Bay Lynx (Am. Wild Cat)		Carnivora	Felidæ	(Cat)	Felis-rufa
Bear-Black (North America)	American	Carnivora	Ursidæ	(Bear)	Ursus-americanus
	Charlotte Is.	"	"	"	-carlotta
	Everglade	"	"	"	-floridanos
	Glacier	"	"	"	-emmonsi
	Inland White	"	"	"	-kermodei
	Labrador	"	"	"	-somborgeri
	Louisiana	"	"	"	-lutreolas
(South America)	Andean	"	"	"	-ornatus thomasi
	Parmir	"	"	"	-frugelius
	Spectacled	"	"	"	-ornatus

*Numbers in parenthesis indicate varieties beside species mentioned.

NAME		ORDER	FAMILY		GENUS—SPECIES
Bear-Black	(African)	Ungulata	Ursidæ	(Bear)	Ursus-crowtheri
(Asia)	Formosa	"	"	"	-formiosarius
	Himalayan	"	"	"	-torquatus
	Malay Sun	"	"	"	-maylayanus
	Sloth (Baloo)	"	"	"	-labiatus
	Tibet	"	"	"	-tibetanus
(Japan)	Japanese	"	"	"	-japonicus
Bear-Brown	Admiralty	"	"	"	-eulopus
(North America)	Alaska	"	"	"	-kidderi
	"	"	"	"	-merianni
	Barren Ground	"	"	"	-richardsonii
	Cinnamon	"	"	"	-cinnamominus
	Kabuc	"	"	"	
	Kadiac	"	"	"	-midendorffi
	Peninsular	"	"	"	-gyas
	Sitka	"	"	"	-sitkensis
	Yukatat	"	"	"	-dalli
(Asia)	Altai	"	"	"	-lagomirius
	Hairy Eared	"	"	"	-piscator
	Himalayan	"	"	"	-isabellinus
	Kamschatka	"	"	"	-beringianus
	Mongolian	"	"	"	-lasiotis
	Siberian	"	"	"	-collaris
	Syrian	"	"	"	-syriacus
	Ural	"	"	"	-meridionalis
(European)	Russian	"	"	"	-arctos
	Scandinavian	"	"	"	-arctos cadaverius
Bear -Grizzly	Alaska	"	"	"	-alacensis
	Barren Ground	"	"	"	-richardsonii
	Mexican	"	"	"	-horribilis horriæus
	Silver Tip	"	"	"	-horribilis
	Yezo (Japan)	"	"	"	-yessonensis
Bear or White Polar		"	"	"	-maritimus
Beaver		Rodentia	Castoridæ	(Beaver)	Castor-canadensis

NAME	ORDER	FAMILY		GENUS—SPECIES
Beaver Rat	Rodentia	Muridæ	(Rat)	Hydromys-chrysogaster
Bison-American	Ungulata	Bovidæ	(Ox)	Bos-americanus
-European	"	"	"	Bos-bonasus
Black Buck	Ungulata	Antelopinæ	(Antelope)	Antilope-cervicapra
Blessbok	Ungulata	Antelopinæ	(Antelope)	Damaliscus-albifrons
Broadtail	Ungulata	Ovinæ	(Sheep)	Ovis-patyura
Buffalo-African	Ungulata	Bovidæ	(Ox)	Bos-caffer
-Asiatic	"	"	"	-bubalus
-Short-horned	"	"	"	-pumilis
Bassarisk (Cacomistle)	Carnivora	Procyonidæ	(Raccoon)	Basaris-astuta
Calf (ox)	Ungulata	Bovidæ	(Ox)	Bos-taurus
Camel-Bacterian	Ungulata	Camelidæ	(Camel)	Camelus-bactrianus
-Dromedary	"	"	"	-dromedarius
Canada Lynx	Carnivora	Felidæ	(Cat)	Felis-rufa
Caracal	Carnivora	Felidæ	(Cat)	Felis-caracal
Caribou	Ungulata	Cervidæ	(Deer)	Rangifer-groenlandicus
Cat-African	Carnivora	Felidæ	(Cat)	Felis-chrysosthrix
-Bush	"	"	"	-euptilura (7)
-Caffer	"	"	"	-caffra
-Eyra	"	"	"	-eyra
Chaus- (Swamp Lynx)	"	"	"	-chaus
-Desert	"	"	"	-ornata
-Domestic	"	"	"	-domestica
-Golden	"	"	"	-temmincki
-House	"	"	"	-domestica
-Jungle	"	"	"	-bengalensis (7)
-Leopard or Tiger (Asia)	"	"	"	-pollida (20)
(Africa)	"	"	"	-senegalensis (5)
(Malay)	"	"	"	-marmota (2)
(Texas)	"	"	"	-ludoviciana
(Mexico)	"	"	"	-mexicana (3)
(S. A.)	"	"	"	-macroura (8)
Manx	"	"	"	-domestica
-Margay	"	"	"	-tigrina

NAME	ORDER	FAMILY		GENUS—SPECIES
Cat-Molinas	Carnivora	Felidæ	(Cat)	Felis-colo-colo
-Pampas	"	"	"	-payeros (3)
-Panther	"	"	"	-geoffri (2)
-Persian	"	"	"	-domestica
-Tiger (Serval)	"	"	"	-serval
-Wild-American	"	"	"	-rufus
-European	"	"	"	-catus
Chamois	Ungulata	Antelopinæ	(Antelope)	Rupicapra-tragus
Chimpanzee	Primates	Simiidæ	(Ape)	Anthropopithecus (2)
Chinchilla	Rodentia	Chinchilliæ	(Chinchilla)	Chinchilla-brevicaudata
-Bastard	"	"	"	-lanigera
Chinchillone	"	"	"	Largidium-cuvieri
Chipmunk-American	Rodentia	Sciuridæ	(Squirrel)	Tamias-striatus
-Asiatic	"	"	"	-asiaticus
-Californian	"	"	"	-macrotus
Chitah (Cheetah)	Carnivora	Felidæ	(Cat)	Cynoelurus-jubatus
Civet-African	Carnivora	Viverridæ	(Civet)	Viverra-civetta
-Chinese	"	"	"	-zibetha (2)
Coati	Carnivora	Procyonidæ	(Raccoon)	Nasua-nasica and rufa
Colobus	Primates	Ceropithecidæ	(Monkey)	Colobus-(7 species)
Cony (Rabbit)	Rodentia	Leporidæ	(Hare)	Lepus-cuniculus
Coyote	Carnivora	Canidæ	(Dog)	Canis-latrans
Crimmer	Ungulata	Ovinæ	(Sheep)	Ovis-aries
Dasyure	Marsupialia	Dasyuridæ	(Dasyure)	Dasyurus-(2 species)
Deer-East India	Ungulata	Cervidæ	(Deer)	Cervus-axis
-Fallow	"	"	"	Dama-vulgaris
-Mule	"	"	"	Cariacus-macrotis
-N. American	"	"	"	-virginianus
-Red	"	"	"	Cervus-elaphus
Desman (Wuychuchol)	Insectivora	Myogalidæ	(Desman)	Myogale-moschata (2)
Dingo	Carnivora	Canidæ	(Dog)	Canis-dingo
Dog-Antarctic	Carnivora	Canidæ	(Dog)	Canis-antarcticus
-Azara's	"	"	"	-azaræ
-China	"	"	"	-familiaris

NAME	ORDER	FAMILY		GENUS—SPECIES
Dog-Domestic	Carnivora	Canidæ	(Dog)	Canis-familiaris
-Eskimo	"	"	"	-familiaris
-Indian Wild	"	"	"	-deccanensis
-Maned Wolf	"	"	"	-jubatus
-Raccoon	"	"	"	-procyonoides
-Siberian	"	"	"	-alpinus
Dormouse	Rodentia	Myoxidæ	(Dormouse)	Muscadinus (4 species)
Drill	Primates	Ceropithecidæ	(Baboon)	Cynocephalus-leucophoeus
Elk	Ungulata	Cervidæ	(Deer)	Alces-machlis
Ermine	Carnivora	Mustelidæ	(Weasel)	Mustela-erminea (28)
Ferret	"	"	"	Putorius-furor
Fisher	"	"	"	Mustela-pennanti (2)
Fitch (German)	"	"	"	Mustela-putorius
Fossane (Fossa)	Carnivora	Viverridæ	(Civet)	Cryptoprocta-ferox
Fox-Arctic or Blue	Carnivora	Canidæ	(Dog)	Canis-lagopus
-Black	"	"	"	-fulvus
-Blue	"	"	"	-lagopus
-Cape (Cape Jackal)	"	"	"	-mesomelas
-Cossac	"	"	"	-cossac
-Cross	"	"	"	-fulvus
-Grey	"	"	"	-virginianus
-Hoary	"	"	"	-canus
-Indian	"	"	"	-bengalensis
-Japanese (Raccoon Dog)	"	"	"	-procyonoides
-Kit	"	"	"	-velox
-Pale	"	"	"	-pallidus
-Patagonia	"	"	"	-peninsula
-Persian	"	"	"	-persica
-Red	"	"	"	-fulvus
-Russian	"	"	"	-eversmani
-Sea (Raccoon Dog)	"	"	"	-procyonoides
-Silver	"	"	"	-fulvus
-White or Polar	"	"	"	-lagopus
Gaur	Ungulata	Bovidæ	(Ox)	Bos-gaurus

NAME	ORDER	FAMILY		GENUS—SPECIES
Gayal	Ungulata	Bovidæ	(Ox)	Bos-frontalis
Gazelle	Ungulata	Antelopinæ	(Antelope)	Gazella-euchore
Genet-Blotched	Carnivora	Viverridæ	(Civet)	Genetta-tigrina
-Common	“	“	“	-vulgaris
Gibbon	Primates	Simiidæ	(Ape)	Hylobartes-(5)
Glutton	Carnivora	Mustelidæ	(Weasel)	Gulo-luscus
Gnu	Ungulata	Antelopinæ	(Antelope)	Connochœtes-taurina
Goat-Angora	Ungulata	Caprinæ	(Goat)	Capra-angorensis
-Cape	“	“	“	-hircus
-Cashmere	“	“	“	-lanigeri
-Common	“	“	“	-hircus
-China	“	“	“	-chinensis
-Ibex	“	“	“	-ibex
-Italian	“	“	“	-hircus
-Mongolian	“	“	“	-mongolica
-Norwegian	“	“	“	-hircus
-Rocky Mountain	Ungulata	Bovidæ	(Ox)	Haploceros-montanus
-Russian	Ungulata	Caprinæ	(Goat)	Capra-hircus
-Siberian	“	“	“	-hircus
-Syrian	“	“	“	-hircus
-Tibet	“	“	“	-villanosa
Gorilla	Primates	Simiidæ	(Ape)	Gorilla-savagei
Grison	Carnivora	Mustelidæ	(Weasel)	Galictis-vittata
Guanaco	Ungulata	Camelidæ	(Camel)	Lama-huanacus
Hairseal	Carnivora	Phocidæ	(True Seal)	(Various Genera)
Hamster	Rodentia	Muridæ	(Mouse)	Cricetus-frumentarius
Hare-Alpine	Rodentia	Leporidæ	(Hare)	Lepus-timidus
-American	“	“	“	-americanus
-Belgian	“	“	“	-europæus
-Brazilian	“	“	“	-braziliensis
-Common	“	“	“	-europæus
-Grey or Wood	“	“	“	-sylvaticus
-Mountain	“	“	“	-variabilis
-Polar	“	“	“	-glacialis

NAME	ORDER	FAMILY		GENUS	SPECIES
Hare-Prairie	Rodentia	Leporidæ	(Hare)	Lepus	-campestris
Hyæna-Brown	Carnivora	Hyænidæ	(Hyæna)	Hyæna	-brunnea
-Spotted	"	"	"		-crocuta
-Striped	"	"	"		-striata
Ibex	Ungulata	Caprinæ	(Goat)	Capra	-ibex
Ichneumon	Carnivora	Viverridæ	(Civet)	Herpestes	-ichneumon
Jackal	Carnivora	Canidæ	(Dog)	Canis	-aureus (7)
-Cape	"	"	"		-mesomelas
Jaguar	Carnivora	Felidæ	(Cat)	Felis	-onca
Jaguarondi	"	"	"		-yaguarondi
Japan Mink	Carnivora	Mustelidæ	(Weasel)	Mustela	-itatsi
Kangaroo	Marsupialia	Macropodidæ	(Kangaroo)	Macropus or Halmaturus(23)	
Kinkajore	Carnivora	Procyonidæ	(Raccoon)	Cercoleptes	-candivolvulus
Koala	Marsupialia	Phalangeridæ	(Australian Bear)	Phascolarctus	-cinereus
Kolinsky	Carnivora	Mustelidæ	(Weasel)	Mustela	-sibirica
Lamb-Astrachan	Ungulata	Ovinæ	(Sheep)	Ovis	-aries (patyura)
-Bokharan	"	"	"		-aries (patyura)
-Cape	"	"	"		-aries (steatopyga)
-China	"	"	"		-aries (steatopyga)
-Crimea (Krimmer)	"	"	"		-aries (patyura)
-Danada	"	"	"		-aries (patyura)
-Iceland	"	"	"		-aries (steatopyga)
-Persian	"	"	"		-aries (patyura)
-Pinhead Persian	"	"	"		-aries (patyura)
-Shiraz	"	"	"		-aries (patyura)
-Slink	"	"	"		-aries (steatopyga)
-Tibet	"	"	"		-hodgsonii
-Ukrainer	"	"	"		-aries (patyura)
Largotis	Rodentia	Chinchilliæ	(Chinchilla)	Largidium	-cuvieri
Lemming	Rodentia	Muridæ	(Mouse)	Myodes	-lemmus
Lemur	Primates	Lemuridæ	(Lemur)	(Various Genera)	
Leopard-African	Carnivora	Felidæ	(Cat)	Felis	-pardus
-Black	"	"	"		-pardus
-Chinese	"	"	"		-pardus

NAME	ORDER	FAMILY		GENUS—SPECIES
Leopard-Clouded	Carnivora	Felidæ	(Cat)	Felis-nebulosa (2)
-East India	"	"	"	-pardus
-Hunting (Chitah)	"	"	"	-jubatus (cynœlurus)
-Persian	"	"	"	-pardus
-Snow (Ounce)	"	"	"	-uncia
Lion	Carnivora	Felidæ	(Cat)	Felis-leo
Llama	Ungulata	Camelidæ	(Camel)	Lama-peruana
Lynx-American	Carnivora	Felidæ	(Cat)	Felis-canadensis
-Bay (Wild Cat)	"	"	"	-rufa
-Caracal (Red Lynx)	"	"	"	-caracal
-European	"	"	"	-lynx or vulgaris
-Isabella	"	"	"	-isabellina
-Pardine	"	"	"	-pardinus
-Swamp (Chaus)	Carnivora	Felidæ	(Cat)	Felis-chaus (4)
-Spotted	"	"	"	-maculatus
Lynx Cat (Wild Cat)	"	"	"	-rufa
Mandrill	Primates	Ceropithecidæ	(Baboon)	Papio-morman
Mangabey	Primates	Ceropithecidæ	(Monkey)	Cerocebus-(2)
Marmoset	Primates	Halpalidæ	(Marmoset)	(Two Genera)
Marmot-Alpine	Rodentia	Sciuridæ	(Squirrel)	Arctomys-marmotta
-Am. (Woodchuck)	"	"	"	-monax
-Himalayan	"	"	"	-himalyanus
-Hoary	"	"	"	-pruinosus
-Rocky Mountain	"	"	"	-flaviventer
-Russian	"	"	"	-bobac
Marten-Baum (Pine)	Carnivora	Mustelidæ	(Weasel)	Mustela-martes
-Beech (Stone)	"	"	"	-foina
-Brown	"	"	"	-americana
-Indian	"	"	"	-flavigula
-Japanese	"	"	"	-melanopus
Mink-American	"	"	"	-vision
-Chinese (Who Long)	"	"	"	-stegmanii (2)
-European	"	"	"	-lutreola
-Japanese (Istatsi)	"	"	"	-itatsi

NAME	ORDER	FAMILY		GENUS—SPECIES
Mink-Russian	Carnivora	Mustelidæ	(Weasel)	Mustela-lutreola
Mole	Insectivora	Talpidæ	(Mouse)	(Two Genera)
Monkey-Abyssinian (Guereza)	Primates	Ceropithecidæ	(Monkey)	Collobus-guereza
-Black	"	"	"	-satanus
-Blue	"	"	"	Cerocebus-fuliginosis
-Campbell's	"	"	"	Ceropithecus-campbelli
-Common	"	"	"	Ceropithecus-(20)
-Diana	"	"	"	-diana
-Green	"	"	"	-callithricus
-Grey	"	"	"	-diana
-Grivet	"	"	"	-griseo-viridis
-Moustache	"	"	"	-cephus
-Patas	"	"	"	-patas
-Pluto	"	"	"	-pluto
-Red	"	"	"	-erythrogasta
-Vervet	"	"	"	-lalandi
-Wanderoo	"	"	"	Macacus-silenus
Moose	Ungulata	Cervidæ	(Deer)	Alces-machlis
Mouflon	Ungulata	Ovinæ	(Sheep)	Ovis-musimon
Musk Ox	Ungulata	Ovibromæ	(Musk Ox)	Ovibos-moschatus
Muskrat	Rodentia	Muridæ	(Rat)	Fiber-zibethicus
Mungoose	Carnivora	Viverridæ	(Civet)	Herpestes-mungo
Nutria	Rodentia	Octodontidæ	(Rat)	Myopotamus-coypus
Ocelot	Carnivora	Felidæ	(Cat)	Felis-pardalis
Opossum	Marsupialia	Didelphyidæ	(Opossum)	Didelphys
-Australian	Marsupiala	Phalangeridæ	(Phalanger)	Trichosurus-vulpecula
Orang-Utang	Primates	Simiidæ	(Ape)	Simia-(4)
Otter-American (6)	Carnivora	Mustelidæ	(Weasel)	Lutra-canadensis
-African	"	"	"	-capensis (2)
-Asiatic (Bagdad)	"	"	"	-chinensus (7)
-Brazilian	"	"	"	-braziliensis
-Common	"	"	"	-vulgaris
-European (common)	"	"	"	-vulgaris
-Japanese	"	"	"	-japonica

NAME	ORDER	FAMILY		GENUS—SPECIES.
Ouistitis	Primates	Halpalidæ	(Marmoset)	Halpale-jacchus (8)
Ounce (Snow Leopard)	Carnivora	Felidæ	(Cat)	Felis-uncia
Ox	Ungulata	Bovidæ	(Ox)	Bos-taurus
Pedemelon (Paddy Melon)	Marsupialia	Micropodidæ	(Kangaroo)	Onychogale-frenata
Pahmis	Carnivora	Mustelidæ	(Weasel)	Helictus-ferrogrisea
Panda	Carnivora	Procyonidæ	(Raccoon)	Aelurus-fulgens
Panther	Carnivora	Felidæ	(Cat)	Felis-concolor
Paradoxure	Carnivora	Viverridæ	(Civet)	Paradoxurus-(2)
Persian Lamb	Ungulata	Ovinæ	(Sheep)	Ovis-aries (patyura)
Perwitsky	Carnivora	Mustelidæ	(Weasel)	Putorius-sarmaticus
Phalanger	Marsupialia	Phalangeridæ	(Phalanger)	Trichosurus-vulpecula
Platybus	Monotremata	Ornithorhynchidæ	(Platybus)	Ornithorhynchus-anatinus
Polecat-European	Carnivora	Mustelidæ	(Weasel)	Mustela-putorius
-Siberian	"	"	"	-eversmanni
Pony (Colt)	Ungulata	Equidæ	(Horse)	Equus-caballus
Prairie Dog	Rodentia	Sciuridæ	(Squirrel)	Cynomys-ludovicianus
Prong-Horn	Ungulata	Antelopinæ	(Antelope)	Antilocapra-americana
Puma	Carnivora	Felidæ	(Cat)	Felis-concolor
Rabbit (Cony)	Rodentia	Leporidæ	(Hare)	Lepus-cuniculus
Raccoon	Carnivora	Procyonidæ	(Raccoon)	Procyon-lotor
-crab-eating	"	"	"	-cancrivorus
Rasse	Carnivora	Viverridæ	(Civet)	Viverra-rasse
Rat Coypu	Rodentia	Octodontidæ	(Nutria)	Myopotamus-coypus
Ratel (Honey Badger)	Carnivora	Mustelidæ	(Weasel)	Mellivora-ratel
Reindeer	Ungulata	Cervidæ	(Deer)	Rangifer-tarandus
Ring-tail	Marsupialia	Phalangeridæ	(Phalanger)	Phalangista-peregrinus
Sable-Hudson's Bay	Carnivora	Mustelidæ	(Weasel)	Mustela-americana
-Russian	"	"	"	-zibellina
-Tartar	"	"	"	-sibirica
Seal-Eared-Alaska (Fur)	Carnivora	Otariidæ	(Sea-Bear)	Callorhinus-ursinus
-Cape "	"	"	"	Arctocephalus-pusilla
-Cape Horn "	"	"	"	-falklandicus
-Copper Is. "	"	"	"	Callorhinus-ursinus
-Japanese "	"	"	"	-ursinus

NAME	ORDER	FAMILY		GENUS SPECIES
Seal-Eared-Lobos-Is. (Fur)	Carnivora	Otariidæ	(Sea Bear)	Arctocephalus-falklandicus
-Robben Is. "	"	"	"	Callorhinus-ursinus
-Shetland "	"	"	"	Arctocephalus-australis
-Victoria "	"	"	"	Callorhinus-ursinus
-Australian (Hair)	Carnivora	Otariidæ	(Sea Lions)	Zalophus-lobatus
-Californian "	"	"	"	-califonianus
-Hooker's "	"	"	"	Otaria-hookeri
-Northern "	"	"	"	Otaria-jubata
-Patagonia "	"	"	"	Eumatropias-stelleri
Seal-True-Common (Hair)	Carnivora	Phocidæ	(Sea Dog)	Phoca-vitulina
-Crested "	"	"	"	Crystaphora-cristata
-Elephant "	Carnivora	Phocidæ	(Sea-Elephant)	Machrorhinus-leoninus
-Greenland "	Carnivora	Phocidæ	(Sea Dog)	Phoca-groenlandica
-Grey "	"	"	"	Halichoerus-grypus
-Leopard "	"	"	"	Ogmorhinus-Leptonyx
-Ringed "	"	"	"	Pagomys-fœtidus
-Weddell's "	Carnivora	Phocidæ	(Sea-Leopard)	Leptonychoetus-weddelli
Sea Otter	Carnivora	Mustelidæ	(Weasel)	Latax-lutris
Serval	Carnivora	Felidæ	(Cat)	Felis-serval
Sheep-China	Ungulata	Ovinæ	(Sheep)	Ovis-aries (steatopyga)
-Bokhara	"	"	"	-aries (patyura)
-Domestic	"	"	"	-aries
-Iceland	"	"	"	-aries (steatopyga)
-Mouflon	"	"	"	-musimon
Skunk	Carnivora	Mustelidæ	(Weasel)	Mephitis-mephitica
-Little Striped	"	"	"	-putorius
-Mexican	"	"	"	Mustela-macrura
-S. American	"	"	"	Conepatus-mapurito
Slink Lamb	Ungulata	Ovinæ	(Sheep)	Ovis-aries (steatopyga)
Spring Bock	Ungulata	Antelopinæ	(Antelope)	Gazella-euchora
Spermophile-Leopard	Rodentia	Sciuridæ	(Squirrel)	Spermophilis-tridecemlineatus
-Long Eared	"	"	"	-grammurus
Squirrel-American Grey	Rodentia	Sciuridæ	(Squirrel)	Sciurus-carolinensis
-American Red	"	"	"	-hudsonianus

NAME	ORDER	FAMILY		GENUS—SPECIES
Squirrel-European	Rodentia	Sciuridæ	(Squirrel)	Sciurus-vulgaris
-Irawadi	"	"	"	-pygerythrus
-Malayan	"	"	"	-biculor
-Palm	"	"	"	-palmarum
Squirrel-Flying-American	"	"	"	Sciuropterus-volucella
-Malayan	"	"	"	Pteromys-petaurista
-Woolly	"	"	"	Eupataurus-cinereus
Stoat (greater Weasel)	Carnivora	Mustelidæ	(Weasel)	Mustela-erminea
Suslik	Rodentia	Sciuridæ	(Squirrel)	Spermophilis-citillus
Tapir	Ungulata	Tapiridæ	(Tapir)	Tapirus
Tayra	Carnivora	Mustelidæ	(Weasel)	Galictis-barbara
Tibet Lamb	Ungulata	Ovinæ	(Sheep)	Ovis-hodgsonia (steatopyga)
Tiger	Carnivora	Felidæ	(Cat)	Felis-tigris
Vicuna	Ungulata	Camelidæ	(Camel)	Lama-vicugna
Viscacha	Rodentia	Chinchilliæ	(Chinchilla)	Largostomus-trichodactylus
Wallaby	Marsupialia	Macropodidæ	(Kangaroo)	Petrogale & Halmaturus
Walleroo	Marsupialia	Macropodidæ	(Kangaroo)	Macropus-robustus
Wapiti	Ungulata	Cervidæ	(Deer)	Cervus-canadensis
Weasel	Carnivora	Mustelidæ	(Weasel)	Mustela-vulgaris
Wolf-African	Carnivora	Canidæ	(Dog)	Lupus-sinensis
-American Prairie	"	"	"	-latrans
-American-Timber	"	"	"	-lupus-occidentalis
-European	"	"	"	-lupus
-Indian	"	"	"	-pallipes
-Japan	"	"	"	-hydrophlax
-Patagonia	"	"	"	-peninsula
-Siberian	"	"	"	-lanigeri
-Tasmanian	Marsupialia	Dasyuridæ	(Dasyure)	Thylacurus-cynocephalus
-Tibet	Carnivora	Canidæ	(Dog)	Lupus-filchneri
Wolverine	Carnivora	Mustelidæ	(Weasel)	Gulo-luscus
Wombat	Marsupialia	Phascolomyidæ	(Wombat)	Phascolomys
Woodchuck	Rodentia	Sciuridæ	(Squirrel)	Arctomys-monax
Yak	Ungulata	Bovidæ	(Ox)	Bos-grunniens
Zebra	"	Equidæ	(Horse)	Equus-zebra

THE MAMMALIA.

All Fur Bearing animals suckle their young and consequently belong to the class Mammalia, of which Cuvier says:

"The Mammalia is placed at the head of the animal kingdom, not only because it is the class to which man himself belongs, but also because it is that which enjoys the most numerous faculties, the most delicate sensations, the most varied powers of motion; and in which all the different qualities seem combined in order to produce a more perfect degree of intelligence. It is also the most fertile in resources, most susceptible of perfection, and least the slave of instinct.

"As their quantity of respiration is moderate Mammals are designed in general for walking on the earth with vigorous and continued steps. The forms of the articulations of their skeletons are consequently strictly defined.

"The upper jaw in all of these animals is fixed to the cranium; the lower is formed of two pieces articulated by a projecting condyle to a fixed temporal bone; the neck consists of seven vertebrae, one single species which has nine excepted; the anterior ribs are attached before, by cartilage, to a sternum consisting of several vertical pieces; their anterior extremity commences in a shoulder-blade that is not articulated, but simply suspended in the flesh, often resting on the sternum by means of an intermediate bone, called a clavicle. This extremity is continued by an arm, a fore-arm, and a hand, the latter being composed of two ranges of small bones, called the carpus, of another range called the metacarpus, and of the fingers, each of which consists of two or three bones, termed phalanges.

The hind limb, according to Lydecker, differs from the fore-limb "in that the innominate or haunch-bones which together form the pelvis, are connected by an immovable bony union with the sacral region of the vertebral column. The thigh-bone or femur, corresponding to the humerous of the arm, articulates with a cavity in the innominate termed the acetabulum. The leg has two parallel bones articulating with the lower end of the thigh-bone or femur; of which the larger or tibia, occupying the inner side of the limb, corresponds to the radius of the fore-arm, while the smaller outer bone or fibula, represents the ulna. The ankle, or tarsus, corresponds to the carpus in the fore-limb, and likewise consists of two transverse rows of small bones. Two bones of the uppermost row, viz. the calcaneum or heel-bone, and the astragalus or ankle-bone, are specially modified. In the foot proper the bones correspond with those of the hand; those representing the metacarpals being, however, termed metatarsals.

"Most of the mammals have five fingers and toes, or digits, on each foot or hand, but in some cases there is a tendency to the reduction of the number of digits; cattle and deer having only two, corresponding to the third and fourth of the typical series of five; while in the horse only a single digit remains, which in the fore-limb corresponds to the middle or third finger of the human hand, and in the hind-limb to the middle toe.

"Almost all Mammals when adult have both jaws provided with a series of teeth varying greatly in number and structure in the different groups. These teeth are almost invariably fixed in separate sockets; and while the front teeth have but a single root or fang, the side or cheek-teeth very generally have two or more such roots, each of which occupies a separate division of the socket. In all cases the teeth are fixed in their sockets merely by the aid of soft tissues connected with the gum and are never welded to the jaws by a deposit of bone. Very generally there is a sharply-marked line of division, termed the neck, between the root, or portion of the tooth implanted in the jaw, and the crown or exposed portion.

"In most of those Mammals in which the teeth of different parts of the jaw differ in structure from one another, there are two distinct sets of teeth developed during life. The first of the two includes the milk or baby teeth, which are generally shed at a comparatively early age. They are of small size and few in number, and are finally succeeded by the larger and more numerous permanent set, which remain during the rest of life, unless previously worn out.

"Those Mammals in which the permanent teeth differ from one another in form in different regions of the jaw, we are enabled from their position, and also from their relations to the temporary series of milk-teeth, to divide into four distinct groups. Taking one side of the upper jaw of the dog we find the front bone, or premazilla, carrying a small number of simple cutting teeth, termed incisors. Behind these teeth, from which it is generally separated by a longer or shorter gap, there is a tooth with a simple and often conical crown, which, like the incisors, is inserted in the jaw by a single root. This tooth, which is usually larger than the incisors, is termed the tusk, or canine tooth, and in the wild boar and most Carnivorous Mammals attains a very large size. It can always be distinguished from the incisors by the fact that it is implanted in the maxilla, or second bone of the jaw, or at least on the line of junction between that bone and the premaxilla. Behind the canine we have a series of teeth, which may be as many as seven, with more complicated crowns, and except the first, inserted in the jaw by two or more roots. This series may be collectively known as the cheek teeth; but they may be divided into two minor groups according as to whether they are preceded by milk-teeth or not. In the dog the four teeth immediately behind the canine, with the exception of the first, are the vertical successors of milk-teeth, and are known as premolars; while the two hindmost teeth which have no such temporary predecessors, are known as true molars, or molars. In the lower jaw the tooth, usually larger than the others, which bites in front of the upper canine is the lower canine. In advance of this tooth are the incisors, and behind it the pre-molars and molars, distinguished from one another in the same manner as are the corresponding teeth of the upper jaw.

"With the exception of the Pouched Mammals, there are in practically all the Mammals with teeth of different kinds, never more than three incisors, one canine, four premolars, and three molars on either side of each jaw; so that the total number of teeth on both sides of the two jaws is not more than forty-four.

"In regard to the external covering, hairs are always present on some portion of the body during some period of life. In the whales these hairs may, however, be reduced to a few bristles in the region of the mouth, which disappear when the animal attains maturity. Mammals never develop that modified kind of hair-structure known as feathers, which are peculiar to Birds. The body may, however, be covered with overlapping scales, like those so common in Reptiles, but this occurs only in the pangolins, or scaly ant-eaters of India and Africa. The tail of the common rat is an example of a part of the body covered with scales, having their edges in opposition; but in both these instances hairs are mingled with the scales. Still rarer than scales are bony plates, developed in the true skin. At the present day these structures are only met with among the well-known armadillos of South America, which are furnished with bucklers and transverse bands of these bony plates, and are in some cases able to roll themselves up into a ball, presenting on all sides an impenetrable coat of mail. Between the plates of the armour of the Armadillos hairs are always developed, and in one species these are so abundant as to completely hide the plates themselves, and render the general appearance that of an ordinary hairy mammal.

"The use of hair is mainly to protect the body from cold, and thus to aid in the maintenance of a uniform high temperature; and when hairs are absent, we find this function performed by a more or less thick fatty layer beneath the skin, which, when it is excessively developed, as in the whales, is known as blubber. To compensate for the difference between the temperature of winter and summer, Mammals which inhabit the colder regions of the globe develop a much thicker coat of hair in the former than in the latter season, of which we have an excellent example in the horse. In some Mammals, such as the hare and cat, the body is covered with only one kind of hair; but in other cases, as in the fur-seals, there is one kind of long and somewhat coarse hair, which appears at the surface, and another of a softer and finer nature, which forms the thick and warm under-fur. This under-fur is greatly developed in Mammals of all groups inhabiting Tibet, where it is locally known as "pashm"; and it is this pashm of the goat of these regions which affords the materials for the celebrated Kashmir shawls. Curiously enough, too, animals which usually do not develop pashm almost immediately tend to its production when taken to the Tibetan region, as is notably the case with dogs. Less frequently the hair of the body takes the form of stiff bristles, as on the pig; and still more rarely this thickening is carried to such an extent as to produce spines, of which we have the best instances in the porcupine and hedgehog, belonging, it should be borne in mind, to distinct orders.

"The solid horns of the rhinoceroses, and the hollow horny sheaths of cattle and antelopes are very similar in their nature to hairs, and may indeed be compared to masses of hair welded together into solid structures.

"Mammals differ from Fish, Amphibeans and Reptiles in having warm blood which is propelled from a four chambered heart through a double circulating system; one part causing the blood to pass through the lungs to take in a fresh supply of oxygen from the air, and the other serving to supply the freshly oxygenized blood to the various organs and members of the body; the blood for the nourishment of the body being propelled from the heart by a single vessel known as the aorta, which passes over the left branch of the wind pipe.

"With the exception of the egg laying Monotremes, Mammals are invariably born in a living condition, and whether they live on the land or in the water breathe air by means of lungs suspended in the chest. As a rule they have the two pair of limbs characteristic of vertebrates, but occasionally, as in the whales, the hinder pair may be wanting. In some cases, like the kangaroos and jumping mice, the hind limbs are enormously elongated and progression is affected by means of leaps and bounds. The opposite extreme of limb structure is shown in the bats; whose hind limbs retain their normal structure, while the fore limbs are enormously elongated to afford support for a leathery wing like structure, by means of which these strangely modified creatures are enabled to fly in the air with the same ease and swiftness as the birds. In the true seals, the hind limbs are directed backward to form with the tail a kind of rudder, while the fore limbs are shortened so as to form paddles for swimming, and as before stated, in the completely aquatic mammals the hind limbs are entirely wanting.

CARNIVORA.

Flesh-eating mammals are designated as Carnivores, although some of them are omnivorous rather than strictly carnivorous. They are all more or less beasts of prey, and their mental system as well as their structure shows the results of their predatory habits.

The bones in all the species of this order are comparatively slender but very strong; as a rule they have thirteen dorsal vertebrae, and with a few exceptions like the cat and dog, they have five toes armed with claws, the thumb or great toe not being opposable to the others so as to enable them to grasp any object.

The jaws of the Carnivores are short and stout, and the head of the lower jaw is usually placed in a deep and narrow socket so that little grinding motion is possible, the movements of the jaw being confined to a vertical plane. The enamel covered teeth are fitted for cutting rather than grinding. There are six incisors in each jaw, the lateral ones being the largest. The canines are strong and conical and in some cases enormously developed. The number of molars varies, but the typical number is four premolars and three molars on each side of each jaw, one of them on each side of each jaw usually being converted into a sectorial tooth that has a compressed cutting edge, and with its fellow of the opposite jaw acts like a pair of shears.

The alimentary tract of the Carnivores is comparatively short and simplified, and they have no vermiform appendix. With the exception of taste their senses are highly developed. As is shown by our classification chart they are divided into two sub-orders, the Fissipedia and the Pinnipedia. The Fissipedia are divided, by some authorities into three groups, of which the Bear, the Dog and the Cat are the respective types. Most of the varieties of the first two walk on the sole of the foot, and are known as Plantigrades, while the majority of the other group are called digitigrades because they walk on the ends of the toes.

THE BEAR FAMILY.

(Ursidae.)

All members of the Bear family have a marked resemblance to one another, and are of heavy massive build, with thick limbs, extremely short tails, and the five toes on each foot armed with powerful fixed claws. Their ordinary gait is slow and measured, and they plant the foot squarely on the ground so the impression is very much like that made by the human being; this feature being more marked in the case of the Bear than in that of other animals of the plantigrade order. Like the dogs they have two pairs of molar teeth in the upper jaw and three in the lower, but the shape of the teeth is different. The Bears are evidently descended from dog-like animals, but the majority of them subsist on a vegetable diet or on insects to a much greater extent than on flesh. All Bears are notoriously deficient in hearing and have poor sight, but their sense of smell is very acute. They differ in many important particulars from all other carnivorous animals, and are rightly classed as a separate family with a comparatively small number of species. The fur of the Bear is always coarse, and generally long, thick and shaggy, and of one color all over the body if we except the white collar sometimes found around the neck of the black and the brown Bear. With the exception of a few peculiar species all Bears have forty-two teeth, and the soles of the feet are bare, while the small ears are thickly haired.

BROWN BEAR.

The Brown Bear (Ursus-arctos), is the best-known member of the Bear family. The Grizzly Bear of North America, the Syrian Bear, the Isabellan Bear of the Himalayas, and numerous others are really local races of the Brown Bear rather than distinct species of their kind.

The Brown Bear is an inhabitant of almost the whole of Europe and of Asia to the north of the Himalayas; and is also comparatively common in many parts of Scandinavia, Hungary and Russia. In Kamschatka it is very plentiful and attains to large dimensions.

The **Brown or Common Bear of Europe** has a convex forehead; on the cubs the fur is woolly, but grows smoother with age and changes from its original whitish color to varying shades of brown, or a greyish hue, in some specimens bordering on the silver. All the young have a white collar which in some varieties remains through life. There is also considerable variation in height, without any fixed relation to age and sex. This animal inhabits the lofty mountains and great forests of Europe and Asia, and lodges high up in the trees; the coupling season is in June, and the young are produced in January. When young the flesh of this animal is esteemed a delicacy and the paws are good eating at all ages.

The favorite haunts of this species are wooded, hilly districts, and in the higher latitudes they hibernate regularly in the winter. They are unsociable animals, but occasionally a male and female will be seen together accompanied by their cubs. In some sections they kill and eat other animals, but generally speaking the Brown Bears are insect and vegetable feeders. In Kamschatka they are said to subsist largely on salmon. In pursuing the salmon a Bear will walk slowly into the water to a depth of about eighteen inches, and facing down stream will wait motionless for its prey; the careless fish swimming up the river mistakes the Bear's legs for tree stumps, and so falls an unconscious victim to the lightning stroke of the Bear's forepaw.

The Brown Bear is uncouth in appearance and movement, but it can travel pretty fast in a shambling kind of a gallop. It never voluntarily attacks a human being, but when angered it is capable of inflicting terrible injuries when thrashing around with its paws. From its anatomical construction there would seem to be little foundation for the stories told of its hugging powers. Is is easily tamed and taught to perform tricks. It is remarkable for its longevity, some of the species having been known to live over forty years, and a case is recorded of a female Brown Bear giving birth to a cub at the age of thirty-two years.

GRIZZLY BEAR.

The largest of all Bears, the Grizzly (Ursus-horribilis), is a native of western North America, where it ranges from Mexico to Alaska. In the northern part of its range it hibernates, but in the south it remains active all winter. The Silver Tip, Barren Ground, Roachback, Cinnamon and Isabella are all varieties of the Grizzly; and its differences of form are as marked as its wide range in color; some of the species have a well-defined hump on the back which is entirely wanting in others, and there is also a wide variation in the width of the sole of the hind feet, Accounts vary greatly as to the size and weight of the Grizzly, but there is no doubt that this animal sometimes attains to thirteen feet in length, and 1,100 pounds in weight, but the average weight of a large male Grizzly is nearer 800 pounds.

The Grizzly feeds on flesh, nuts and acorns. It is a poor climber, but has prodigious strength; one of the species has been known to break the neck of a tall bison with a single blow of its paw, and another to have carried off over rough ground a male Wapiti weighing over 1,000 pounds. Sir Samuel Baker says, "It will kill several deer and leave them untouched on the ground at daybreak the following morning." It is credited with extreme ferocity towards man.

BLACK BEAR.

As the Grizzly is the largest so the Black Bear (Ursus-americanus), is the smallest member of the American Bear family. It seldom exceeds five feet in length, and its fur is smoother, glossier and less shaggy than that of either the Brown or Grizzly Bear. It is said by Col. E. D. C. Alexander, that the Black Bear formerly frequented "all the mountains, the thickets of the vast plains, and every creek, river and bay bottom, from Labrador and Canada to the Gulf of Mexico. At present its habitat is confined to the mountains south of the St. Lawrence River and the Great Lakes and east of the Mississippi River, if we except the few that are still found in the dense thickets of the Colorado, Trinity and Brazos Rivers."

When full grown, the **American Black Bear** will stand about three feet high and weigh fully 600 pounds. It feeds on frogs, fish, turtles, the smaller rodents, insects, honey, berries, roots and vegetables, with a decided preference for a frugiverous diet; but some writers claim that it is gradually growing more carnivorous and bolder, and cite in proof of this contention a growing disposition to raid barn yards and slay and eat poultry, sheep, pigs and even calves. The Black Bear is an excellent swimmer and a good climber, but cannot go up into the tree tops, or out upon the branches, because of its weight.

The Black Bear hibernates regularly in winter; but the male remains active as long as he can find an abundance of food, while the female always seeks shelter as soon as cold weather comes in a den excavated under the root of a fallen tree, or beneath a pile of logs, with a few bushes and leaves scooped together for a bed. Sometimes the den is a great hole dug into the side of a knoll. The young, who are usually born in January or February, number from two to four to a litter. If the indications point to a severe winter and there is a scarcity of food these animals will take great pains to make a comfortable nest; but when the weather permits them to stay out late they do not fix up their dens at all; but simply crawl into any convenient shelter, letting the snow complete a covering which forms into an icy wall as their breath condenses and freezes into it, increasing in thickness and extent day by day until they could not escape from their icy cell, even if they would, before they are liberated by the sun, in April or May.

The Himalayan Black Bear, with its pure white chin, long side whiskers, and large ears, is unquestionably the handsomest representative of the Bear Family. **The Malay Sun Bear** is the smallest, ugliest and most ill tempered of the lot, but in size the **Japanese Black Bear** approaches it closely.

Among the peculiar species we find the **Spectacled Bears** of South America, which are distinguished by their very glossy jet-black coats, small ears, long feet and the imperfect circles of white around their eyes.

POLAR BEAR.

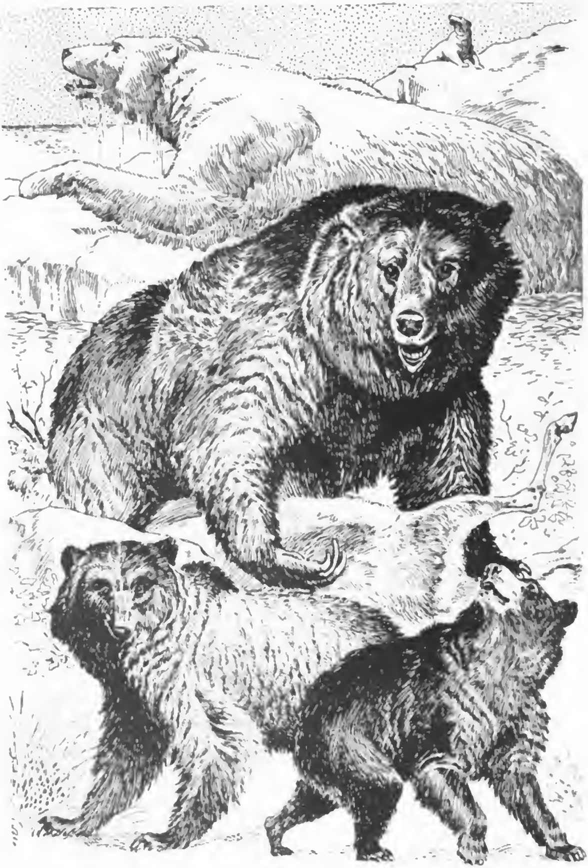
The Polar Bear (Ursus-maritimus), has a smaller and more elongated head, longer neck, shorter ears, and smaller teeth than other Bears; and is also distinguished by the white coat which it retains all the year round. In this respect it differs from other white mammals, who generally exchange their winter dress for one of darker color in the summer. This animal is one of the largest members of the Bear family. In attacking its enemies it does not hug or strike with its claws like the others of its kind, but bites; stories of its ferocity have however been greatly exaggerated, for unless rendered fierce by hunger or an attack it is rarely known to molest a man. The most dangerous and aggressive of the species is the large male of a yellowish or dirty white tinge. A large, fat male Polar Bear will sometimes weigh from 600 to 700 pounds, and measure as much as nine feet. The speed of the Polar Bear is considerable, but Indians have been known to overtake and kill it after a fair chase.

The Polar Bear is found in the Arctic regions of both hemispheres, and generally lives on the coasts of islands surrounded by ice although it is often found on ice fields far out at sea. Its principal food consists of the flesh of Seals and Walruses, but it also eats sea weed, grass, lichens and smaller fish.

In the Hudson's Bay district the females proceed to hibernate for the purpose of producing their young about the end of September and reappear in the spring, two cubs generally being produced at a birth. Hibernation takes place on some distant island. The males accompany their consorts to their resting place, but leave them there, while they return to the coast to hunt throughout the winter.

The fur of the Black, Brown and Grizzly Bear is made into muffs and neck pieces as well as sleigh robes and rugs; but the skin of the Polar Bear is only used for floor rugs.

POLAR BEAR.



GRIZZLY BEAR.

BROWN BEAR. BLACK BEAR.

THE CAT FAMILY.

"Of all the Carnivora, the Cats are the most completely and powerfully armed. Their short and round muzzles, short jaws, and particularly their retractile nails, which raised perpendicularly and hidden between the toes by the action of an elastic ligament when at rest lose neither point nor edge, render them formidable animals.

"They have two false molars above, and two below. Their superior carnivorous tooth has three lobes and a blunted heel on the inside, the inferior has two pointed and trenchant lobes without any heel. They have a very small canine tooth above, without anything below to correspond."

The species are all similar in form, but vary greatly in size, length of hair and color.

All the Felidae have five digits on the fore feet, and four on the hind ones; when ready to strike they crouch and spring upon their victim which they fasten "by the deadly grip of the well armed jaw, and the united action of eighteen fully extended piercing claws. The fore-limbs are endowed with a freedom almost equal to that of the Primates, and can be bent, extended and turned with the utmost ease and swiftness, and deal a blow as readily as the fists of a man." Although cats possess only thirty teeth—twelve less than the dog—they have every variety of tooth needed by a carnivorous mammal. Their eyes are large, but the pupil possesses a power of contraction under the influence of sunlight, that enables some species to reduce it to a vertical slit and others to a small round aperture.

The European Wild Cat (Felis-catus) is now extinct in England where it was very common at one time, but it is still found in Scotland, Southern Russia, Turkey, Greece, Hungary, Germany, Spain, Dalmatia, Switzerland and in some parts of Asia. During the middle ages its fur was commonly used for trimmings, and a canon of the year 1227 forbade any abbess or nun to wear more costly fur than that of lambs or cats. W. A. Lockington says: "This cat is larger and more strongly built than any domestic cat, and has a stouter and shorter head, and a thick tail which does not taper. It is usually yellowish grey in color with a dark streak along the back, numerous darkish stripes down the sides and across the limbs, and has black rings on the tail. It is a very savage animal even as a kitten, and sometimes attains a length of more than three feet from tip to tip. The female, who carries her young sixty-eight days, makes her nest in the hollows of trees or clefts of rocks, or even uses the deserted nest of some large bird." Some naturalists claim that the domestic cat is descended, at least in part, from this species, but the Egyptian Cat

THE EGYPTIAN CAT.

(Felis-caliata), whose range extends throughout Africa and also into Asia, is probably the ancestor of most of the varieties of the Felis-domestica. The color of this species varies from a pale red to grey, always marked with more or less obscure stripes on the body and more distinct ones on the hind limbs, the tail is ringed and has a black tip; it has been known by different names at different times, and probably the Felis-chaus of Africa really belongs to this species, as the hinder parts of its feet are sometimes black.

THE DOMESTIC CAT.

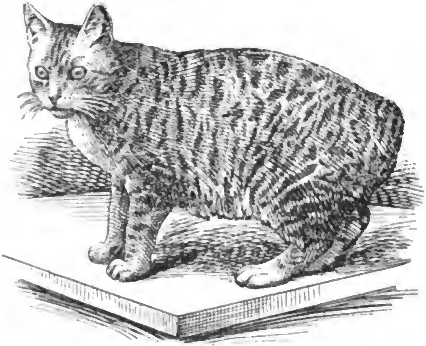
Not every Domestic Cat is a house cat, but all House Cats belong to Domestic species. While the skins of a number of varieties of domesticated cats who live out doors are extensively used by furriers, the skin of the House Cat is of little commercial value.

The House Cat of our homes is one of the animals that has become attached to civilization all over the world. There are many species in the Cat Family, but the House Cat is the one familiar to us all. We have all played with it in childhood or watched it roll the spools or grandmother's ball of yarn across the kitchen floor, and have heard it purr contentedly before the fire, or seen it basking in the sunshine on the porch of the old homestead. We have all been reminded at times by the sting of the sharp claws hidden in the velvet paws, and its cruelty to the mouse within its grasp, of the inherent treacherous, savage nature that lies dormant under its apparently gentle disposition. The House Cat makes us think of home and the fireside, just as the dog recalls to the memory of most of us, the days in camp and tramps through the woods, or walks along the shore. The Cat is not as intelligent or affectionate as the dog. It is attached to the house and its surroundings, rather than the individual. A dog will follow his master to the ends of the earth and if needs be die in his defense, but the cat will fly from him upon the first approach of danger. The one is a faithful, dumb friend, upon whose loyalty we can always depend, the other is a sleek, unctous brute time server.

The House Cat though naturally timid will fight desperately in its own defense. No one who has lain awake listening to the caterwauling of this animal, ranging in volume of sound from the low plaintive cry of an infant, to the loud, discordant tones of an enraged virago, will doubt that there is a cat in every well regulated household—and some to spare.

This animal begins to produce at the end of the first year; bringing forth four to six young ones, two or even three times a year.

There are some varieties of House Cats like the Angora species and the tailless Manx Cat that for various reasons have a commercial value. Among other singular breeds may be mentioned the Mombas Cat of Africa, which has short, stiff, close-lying hairs instead of fur. The Persian, believed by some to be descended from the Asiatic Cat, is the largest variety of Domestic Cat, and the Diminutive Paraguay Cat is the smallest representative of the species.

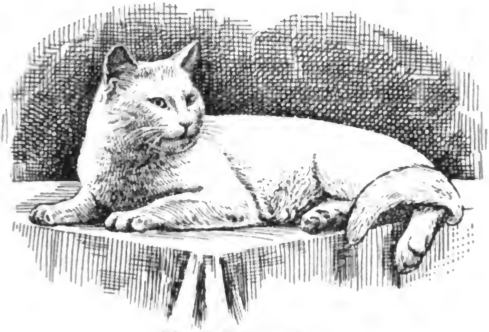


MANX CAT.

The skin of the Domestic Cat like that of other cats is much thicker at the head than on the rest of the body, as a natural protection to the males in fighting. Owing to the elasticity of its limbs, and the freedom with which the skin moves on the body, it can also fall or jump from a great height without sustaining serious injury.

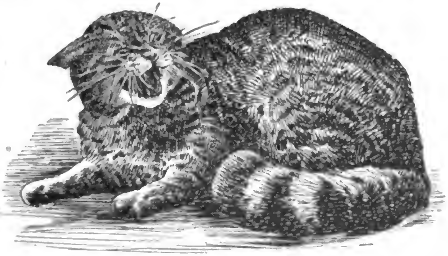
The black skins are the most valuable, and the largest and best of these come from Holland. Denmark and Holstein also produce good black skins, and fair and medium skins are obtained in Germany, France and Switzerland. Russia produces many skins, but they are of poor quality. All cat skins have a line of bristly hair running down the back, which is cut out when they are being manufactured into articles of fur wear. The black skins are often called "Genet;" but while they are a good dependable fur it is a misrepresentation to sell them for Genets.

Cuvier says, that the habitat of the Domestic Cat was originally in the forests of Europe; where in its wild state the fur was of a greyish brown with dark transverse undulations and paler below than on the top, and yellowish on the inside of the thighs and feet. Naturalists all claim that if turned out again into the wild the Domestic Cat would go back to its original color and habits.



WHITE AFRICAN CAT.

Everything indicates that the Wild and Domestic Common Cats belong to the same species. The greater length of the more tapering tail of the House Cat being accounted for by the better feeding and greater comfort it enjoys.



EUROPEAN WILD CAT.

The dun and yellow Caffer Cat, of the Cape of Good Hope with its brown or spotted marks, the Bokharan Chaus or Afghan Cat, with its longer, lighter fur and few rings on the tail, the European Wild Cat and all the Domestic or House Cats, are undoubtedly varieties of the same species (Felis-catus).

Reference to the classification charts will show that there are more species of **Leopard and Tiger Cats** in different parts of the world than of any other animal. It is impossible to give a detailed description of each variety here, but the Servals of India and Africa, like the American Ocelot, call for something more than passing notice.

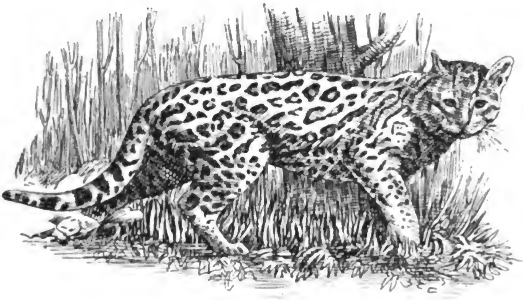
The habitat of the **African Tiger Cat**, as the type species (Felis-serval) is sometimes called, is in Algeria and other parts of East Africa. It is a tall, slender animal with a small head and pointed broad ears. The ringed tail is thick and heavily furred. The ground color is yellow above and white on the under parts. There are four narrow stripes on the head and shoulders, and three or four black stripes running the length of the back. The sides are marked with numerous large round black spots, that also appear on the belly, but farther apart. The Cape Serval is smaller than the Algerian, and has a much longer tail. The orange colored variety found in Senegal has a very short tail, and its under parts are isabella color. It has black ears, black stripes on the back, and full round spots on the sides. There are several other sub-species of the African Serval.

There are two distinct species of the serval found in India; the (Felis-viverrina), which is somewhat smaller than the type species, and the brownish yellow (Felis-himalayana) which is smaller still, and has short close hair, marked on the back with large chocolate colored stripes, and on the under parts with spot-like short stripes of the same color.

The Servals are blood thirsty animals, but can be tamed if taken when young. They prey on the young antelopes, and in settled districts rob the hen coops.

The Margay Cat (Felis-tigrina) is an animal considerably smaller than the Ocelot. Its habitat is the wooded lowlands of Mexico and all the countries between Mexico and Paraguay. It is about two feet long exclusive of the twelve to eighteen inch tail, and the type variety has a rather harsh fur of a dun drizzled color marked with black spots and rings. Other forms have soft reddish fur with black spots that often have a pale center, and a tail that is larger than that of the type species.

Geoffroy's Cat (Felis-geoffroy), found in Paraguay and Chili, and the **Ocelot-like cat** (Felis-pardinoides) of the United States of Columbia, are species nearly related to the Margay cat. The former has a short whitish brown fur, with a white throat and a white streak on the cheeks, and numerous evenly distributed small black spots on the body. It also has four black streaks on the crown, two on the cheeks and one on the chest. The skull is short and broad. The Ocelot-like Cat measures eighteen inches without the ten inch tail, and has dark blotches with a black border, instead of the spots that distinguish the Geoffroy's Cat which it otherwise greatly resembles.



THE OCELOT.

The **Ocelot (Felis-pardalis)**, the largest Leopard Cat of America, is from two to three feet long, and has a twelve-inch tail which is partly ringed. It is a lively and graceful animal, marked more or less with black on the face and light under parts; and showing a great variety of markings on the back and sides. Some specimens are beautifully striped, while others are blotched like a dark tabby cat, but they are all characterized by the oblong shape of the dark spots with drab centers which appear on the sides; on the back the spots are always solid black. The Ocelot is the third largest of the American Felidae, and is sometimes called the Jungle Cat and the Young Jaguar. Its range is from Texas south through Mexico, Central America and South America, down to Southern Brazil.

There are also a number of species of uniform brownish colcred **Panther Cats,** of which the **Jaguarondi** (Felis-yaguarondi), whose range is from Texas through Mexico and Central America to Brazil, is a type. The Jaguarondi has a slender elongated body, a very long tail, and short limbs. It is larger than a good size domestic cat and quite often seen in captivity.

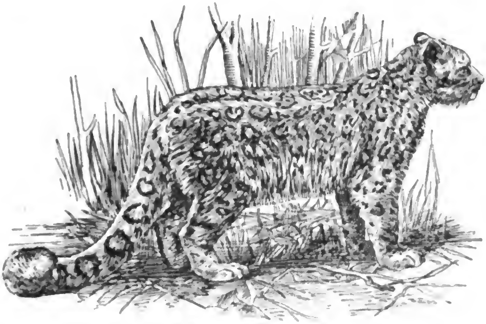
The Pampas Cat (Felis Payeros) is another type of South American Wild Cat. It is distinguished from the Leopard and Panther Cats by its short full tail, and the dark transverse bars on its greyish yellow coat, which cause it to somewhat resemble the European Wild Cat in appearance.

LEOPARDS.

The Leopard, the most graceful and beautiful of all its tribe, is the largest spotted cat of the old world. It is not as large, strong or fierce as the American Puma or Jaguar, but superior in these particulars to all the Felidae of the Eastern continent, except the Lion and the Tiger. The body of a good size Leopard will measure four feet in length, exclusive of the three foot tail. The skull is nine inches long and five inches across at the widest part. There are several distinct species of this animal, and a number of sub-species or varieties of the type species (Felis-pardus), which was called the panther by the ancients, and is now commonly known as the Pard.

The Pard is found in Africa, Southern Asia and the islands of the Indian Archipelego. **The East Indian Leopard** (F. pardus-panther) is the most numerous of the Asiatic Pards. It is a rich reddish yellow color above and white beneath. On each flank it has six or seven rows of large open ring-like black rosets with orange centers, that in some cases are clearly defined. A profusion of solid black spots of different sizes show on the neck, breast, belly and legs, and the head is beautifully marked with black and white stripes. The tail has a black tip and black spots along the entire length, and the ears are also tipped with black. The Pards on the island of Ceylon are somewhat smaller and lighter in color than those inhabiting the central and southern portions of India, and have longer and softer fur. The Leopard of North Eastern India is still smaller and lighter, and more thickly covered with black spots.

The large, dark yellow Pard of southern China, Java, Siam and Sumatra (L. pardus-variagatus), has reddish roset rings, in which the openings are closed with spots of the same color. A smaller variety, with a longer tail, and colored more like the Pardus-panther, and marked with innumerable spots, each made up of two or three black dots, is seen on the island of Sunda.



OUNCE (SNOW LEOPARD).

The Snow Leopard (Felis-uncia), also called the Ounce, is a distinct species. Its habitat is in the Vale of Cashmere, in the Himalayas, and other highlands of central Asia. The fur of this animal is almost two inches long, and white on the surface, but bluish at the roots. In spite of its length, the fur is harsh to the touch; this being due, probably, to its exposed habitat on the mountain wastes. The legs are faintly marked, and the thickly furred tail is longer than the body, and also marked with faint rings. The spots on the head are small, black and solid. From the reference to "The Mountains of the Leopard" in Canticles (IV-8) it would appear, that this animal in ancient times had a habitat in Palestine.

The Black Pard of Java is probably only a color variation, as mothers have been seen nursing young of different hues. It is said that Black Leopards are never seen on the main land, and the skins, some of which are so dark that the spots are hardly perceptible, and others of a greyish shade on which the spots stand out in beautiful contrast, are highly prized.

BLACK LEOPARD.

The Persian Pard (F. pardus-tulliana) is not as graceful as the East Indian Leopard, but larger and slenderer, and very beautiful. The greyish yellow ground color is whitish in places, and marked with black roset rings of solid spots. The range of this animal extends from Persia to the Caucausian Mountains. The (F. pardus-sinensis) of southern China resembles the East Indian Pard in some respects, but is smaller and of a darker yellow color and marked with small spots.

The Chinese Leopard, the (F. pardus-fontaineri) of Mongolia, Manchuria and the entire eastern slope of the Himalayas, has a fine dense fur, that is over an inch long, with black markings showing on the brownish yellow ground color. The hair on the neck and belly is longer than on the rest of the body, and the long thickly furred tail is marked with spots at the base. The (F. pardus-greyi), a much smaller Leopard, is found in the same habitat. The Pard of Turkistan, and the western Himalayas, also has a long fur, but it is coarser and lighter in color than that of the Mongolian Leopard. The Corean Leopards are much lighter than those of northern China, and have shorter tails.

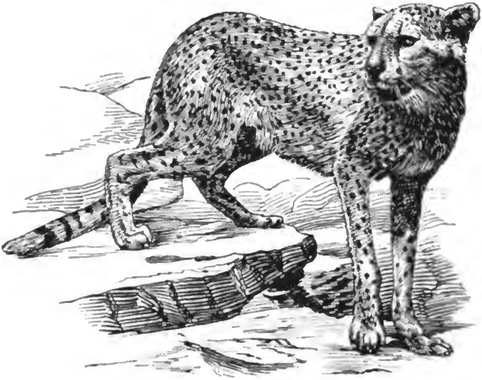
There are several varieties of Pards in Africa south of Senegambia, the most important of which, the **Common Leopard** (Felis-pardus, leopardus) of West Africa, is characterized by its large size, small ears and long tail, which is two-thirds the length of the body. It is light yellow in color, and marked on the head, neck and legs with black spots of various sizes, and on the rest of the body and the tail with rosets formed of five or six small points each. The other African varieties of the Felis-pardus are the (F. pardus-somaliensis) of Abysinnia and Sumaloland, which has larger ears, larger spots and more rosets, and is considerably darker in color than the West African Pard; the (F. pardus-suabelicus) of South Africa that has very large spots; and the (F. pardus-antiquorum) of Algeria, which is the largest and darkest of the African Leopards.

(Felis-Chalibelata), is the designation given to a distinct species, found in the eastern parts of East India. It stands lower than any other Leopard, and has a tail as long as the head and body combined.

The type species of the rare and beautiful **Clouded Leopard**, or panther, has its habitat in the mountains of Northern India, Burma and Siam. It is about the size of an ordinary small leopard. The color is a brownish yellow on the upper parts, and lighter beneath. It has large oblong black spots on the back, and small spots between the two broad bands on the head. The sides are almost entirely covered with large irregular black blotches, and there are a number of dark rings on the tail.

Other species of the Clouded Leopard are: The (Felis-macrocelis) of Borneo, and the (Felis-macrourus) of China.

The Hunting Leopard, (Felis-jubata), has a smaller and shorter head than the Common Leopard; but is longer bodied, and stands higher, though otherwise it is about the same size. Its nails are not retractile. The fur is fawn colored, mottled with uniform black spots; and it has a black stripe on each side of the face, reaching from the eye to the end of the mouth. The disposition of this animal is mild and docile, and its name indicates the purpose for which it is mostly used.



CHITAH

The Chitah or Hunting Leopard, takes kindly to captivity, and permits handling to a greater extent than any other large feline. In the middle ages the Chitah was used in France to stalk the Roebucks and hares, and in India it is still trained to hunt the Antelope. It is drawn blindfolded on a cart to a spot within a few hundred yards of a herd of antelope, when the bandage is removed from its eyes the Chitah singles out some animal in the herd, and approaching it by bounds seizes it and pulls it down.

The Leopards all have a peculiar habit of watching; and all the species and varieties of this animal have the cat habit of sharpening their claws against the trees.

THE LION

The Lion (Felis-leo), the largest, strongest and most courageous member of the Felidae, is rightly named the king of beasts. It was at one time frequently seen in Algeria, Musholaland and other parts of Central Africa, South Western Asia, Arabia and Guzarat in India. In ancient times it was found in much colder climates than its present range, which is becoming more and more restricted. Now the large, lean, short maned East African Lion is the most numerous variety of the Felis-leo. The Lion lives chiefly on sandy plains or in rocky places interspersed with thorn thickets; but it also frequents the low bushes and tall rank grasses and reeds along the edges of streams, where it lies in wait for the larger herbivorous animals upon which it feeds. It is occasionally seen abroad in the day time, but the night is the period of its greatest activity. The Lion usually trots and sometimes even gallops, but its ordinary pace is a walk. It cannot climb, but has been known to jump over fences twelve foot high in pursuit of its prey. It fears nothing but fire.

The roar of the Lion is deep, impressive and appalling; but it is an established fact that formidable and merciless as the Lion is when aroused it will not go out of its way to attack a human, but will avoid a conflict unless it is famished or defending its young, or approached so close that it is afraid to turn and retreat.

The adult male Lion is about ten feet long measuring from the tip of the nose to the end of the tail; the color is a uniform tawny brown, and the tail is tipped with a tuft of elongated black hairs.

There are individual cases where the adult Lion is of a deep red or chestnut brown color, and occasionally one is seen whose skin is almost silver grey. The young when born, and for several months after, are spotted or striped. They play like kittens, and the mother carries them by the back of the neck. The period of gestation is about one hundred days, and from two to three whelps are produced at a birth.

The male of the species possesses a mane which gives the full-grown animal a majestic appearance. The mane is usually black or brown, and sometimes grows beyond the forelegs and is a protection to the male lions when fighting. The mane begins to grow when the animal is about three years old and is fully developed by the time it is five or six years of age. The small ears of the Lion are black or dark brown. The canine teeth are two inches long and in the man-eaters they are blunted or broken. The full-grown male will weigh five hundred and fifty pounds and upwards; but the Lioness, which is much smaller and has no mane, will weigh only two hundred pounds, or even less. There are two marked species of the Lion; the Leo-africanus and the Leo-asiaticus, but there are several varieties of each. The Lion is principally sought for its skin, although the living animals are valuable for menageries and zoological collections. A live male Lion is worth from $1,500 to $2,000; the skins bringing about one-tenth of that amount. The Lioness is much less valuable.

The Lions from different districts show considerable variation in size, color and other external characteristics. The Germans distinguish them as Berberlöwen, Kaplöwen. Massailöwen, Persicher Löwen, Löwen von Guzzerat and so on to the end of the list. The zoologists dvide the different local representatives of the Felis-leo into the following sub species: leo-barbarus, leo-capensis, leo-senegalensis, leo-somaliensis, leo-massaicus, leo-kamptii, leo-persicus and leo-goojratensis.

The Cape Lion is now seldom seen near the Cape or in the Orange Free State, its habitat having been crowded back. The Guzerat Lion, which is the largest representative of the family, and the Persian Lion, the smallest of the tribe, have also become rare. The "Man Eaters" are principally found among the long geared Massai Lions of Central East Africa. The Cape Lion is distinguished by its long dark mane, the now almost extinct Algerian Lion alone surpassing it in this respect. The Northwest African Lion is a smaller variety that is characterized by its orange color and yellow mane.

LYNXES.

All the Lynxes are distinguished by the pencils of black hair which ornament the tips of their ears and the long fringe of hair, black at the base and white at the extremity, that surrounds their faces. They all have very short tails, and their skins are usually more or less spotted but there is considerable variation in color, not only in the various species but in the same animal at different seasons, and at different elevations, or in different localities.

The Jungle Cat (Felis-chaus) is the connecting link that prevents the Lynxes from being considered as a distinct species. It is larger than the domestic cat with which it agrees in having three premolar teeth in the upper jaw, as well as in the form of the lower flesh tooth; but in the circular pupil of its eye, its shorter tail, and a few long hairs on the tips of the ears, it approximates to the Lynxes. In color it varies from a yellowish grey, to a greyish brown, on the back, with reddish white under parts; the cheeks and breast may be either banded or pale, and the tail is always ringed and has a black tip like the ears. Black specimens are seen occasionally. In length it varies from twenty-four to thirty inches, exclusive of the ten inch tail. This animal has a wide range, being found in India, Persia, Ceylon, Burma, Syria and North Africa. It is also known as the Chaus and the Marsh Lynx, although it is sometimes found in the Himalayas at an elevation of eight thousand feet, and frequents the open country as well as the jungles. It breeds twice a year and produces from three to four kittens at a litter. It is very savage and even the young are generally untamable.

The Caracal (Felis-caracal) is believed to be the species to which the expression "Lynx-eyed" owes its origin. It is also known as the Persian and the Red Lynx, although the latter name properly belongs to one of the North American species. The Caracal was the true Lynx of the ancient but is now a rare animal, although its habitat still extends over the greater part of India and a large portion of Africa. This animal is of slender build, from twenty-six to thirty inches long, has a ten inch tail, and stands about eighteen inches high at the shoulders.

The color varies from a reddish fawn to a brownish red, paler on the under than the upper parts of the body; the limbs and the tail are usually the same color as the body, but in some individuals the tail has a black tip; the ears are black on the outside and white within. The Caracal is found in the grass and bushes oftener than in the forests. It feeds on the smaller species of deer, hares, cranes and other birds, and is so active it can jump and capture birds on the wing at a height of five to six feet from the ground. It is easily tamed, and can be taught to capture the animals that are its natural prey.

The Pardine Lynx (Felis-pardinus), of Southern Europe. is the most beautiful of all the Lynxes, clearly defined rounded black spots showing through the soft fur, which is fox red on the upper and white on the lower parts. Cuvier refers to the (Felis-cevaria) of Asia as being the handsomest representative of its family; but from his description it must be a variety of the Pardine Lynx rather than a distinct species, although it appears to be larger in size, and to have a denser fur.

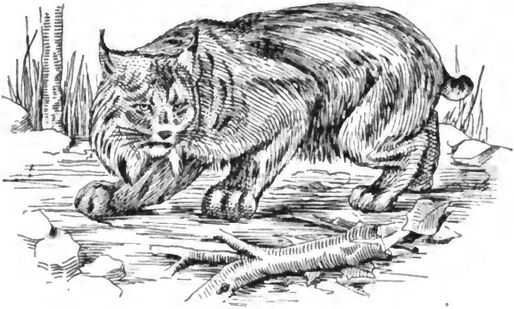
The Persian or Siberian Lynx, which is classed by some zoologists as (Felis-isabellina), is probably a local variety of the Common Lynx of Europe.

Compared with the American Lynx the **Common Lynx of Europe** (Felis-lynx) is a rare animal. It has entirely disappeared from France and some other parts of the continent of Europe, but is still found in considerable numbers in Russia, the Scandinavian Peninsula, Finland and Spain. It is very much like the American type in its soft silvery winter coat, but its summer dress is considerably redder although the color varies in different localities, sometimes being a light brown marked with small black spots. In the milder climates it always has less fur and is more spotted than where it is exposed to extreme cold. In structure, habits and disposition the American and European Lynxes are so much alike that they should properly be considered as different varieties of the same species.

The American Lynx (Felis-canadensis) is abundant in all British North America, except Labrador where the skins are of superior quality, but the animal is comparatively rare. Minnesota appears to be the southern limit of its eastern habitat, but it is sometimes found as far south as the Adirondack Mountains; its range on the western slope of the North American continent extending from Alaska to California. The skins from Nova Scotia, and the eastern part of the Hudson Bay country, closely resemble those of the Norway Lynxes of Europe in the character of the pelt and the beauty of the fur. The California and northwestern varieties, while stronger in the fur, are coarser and redder than the Nova Scotia skins. The Alaska skins have a soft, rich, thick fur, but they are very pale in color. The Sitka skins have a shrivelled appearance but the fur is soft and fine. All the Alaska Lynxes are characterized by the thick hair that protects their large foot pads from the snow.

The American or Canadian Lynx is two feet high, and from three to four feet long including the five inch tail. As is the case with all of its kind, the hind legs are much longer than the front legs, and the claws are quite sharp and retractile and well concealed in the thick foot pads. Its winter pelage consists of a coat of thick soft fur, about one inch long on the back, which is intermixed with longer silvery hairs; the under coat, which in some rare instances is drab or blue or light yellow, generally being light reddish in color on the surface. The ground color of the under fur is invariably a greyish blue; and the fur on the belly is always finer and longer than that on the back, generally showing light spots through the three inch silky hairs. The fur is always thicker and richer on the paler animals than on those of darker hue. In summer the Lynx loses most of its beautiful fur and its chief covering is a brownish red hair. The skin of the Lynx is thin but as is the case with all of the Cat family, it is thicker at the neck than on the other parts of the body.

The Lynx is a shy animal dwelling in the deep forests and bush country where it preys on birds, hares and other small mammals, sometimes attacking young fawns and lambs, but the stories of its killing full grown deer are probably fiction. It is said to swim well, and its ordinary gait is a long gallop like that of a hare, but when leaping over the ground with the back arched it presents a peculiar appearance. The Lynx is hunted for its skin which is very valuable. The hunters either follow its track through the snow, or hunt it with dogs trained to follow the trail by scent till the animal is treed and shot.



LYNX.

The name Lucerne formerly given to the Lynx was probably a contraction of Loup-Cervier, a term applied to it by the early French writers "who ascribed to it a habit of dropping from trees onto the backs of the deers, and destroying them by tearing their throats and drinking their blood."

The Bay Lynx (Felis-rufa), also known as the **American Wild Cat** or **Cat Common**, is placed in a separate species because of its inferior size, uniform reddish color, bushy tail and shorter fur. It shows considerable variation in color and pelage in different localities of its habitat. A handsome spotted variety is found in Texas and southern California, and another with dark vertical streaks in Washington and Oregon; these were formerly regarded as distinct species and classed respectively as Felis-maculata and Felis-faciata. The type species of American Wild Cat is rarely seen as far north as the Adirondacks, being more common in milder climates, where Dr. Merriam says: "They frequent rocky hills and ledges and do not show that antipathy to civilization so marked in their cogener the True Lynx. In fact, the Bay Lynx is often quite common in thickly-settled portions of the country, and sometimes proves of much annoyance to the farmer by carrying off lambs, little pigs, and poultry—ducks, geese, turkeys and chickens proving equally acceptable. Away from the farmyard it feeds upon rabbits, squirrels, mice, grouse, and what small birds it is fortunate enough to capture. It generally makes its nest in a hollow tree or log, and lines it well with moss. From two to four young constitute a litter, the most frequent number being three.''

There is a large and woolly variety of Cat Common found in Nova Scotia, known as the **Canadian or Halifax Bay Lynx,** which is much larger than the other varieties of the species, and has a finer, denser and longer fur. It is a rich grey brown in color and the belly is beautifully marked with black spots, and some of the skins of this animal almost equal those of the true Lynx in quality.

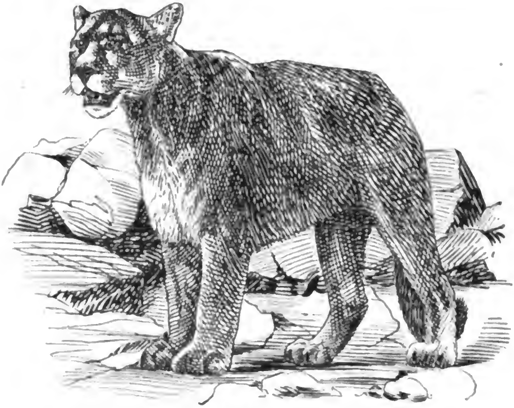
The Plateau Lynx (Felis-baileyi), a species of American Lynx found on the high plateaux of Colorado, Utah and Arizona approximates closer to the Bay Lynx or American Wild Cat than it does to the true Lynx; but it has a shorter tail, softer fur, and a paler light buff color above, and lacks the black markings found on the face and forehead of the Bay Lynx.

The lair of the True Lynx is usually formed among the rocks. It is savage in spite of its timidity, often killing more animals than it can devour. The young are born blind, and from two to three cubs are produced at a birth.

PUMA.

The Puma, sometimes erroneously called the panther, is also known as the American lion. Its principal habitat is in Central and South America, but it is also found in some parts of the North American Continent, at one time being quite common in New York State.

The Puma is a powerful animal from four to five feet long; and its bushy black-tipped tail is nearly as long as the body. It is capable of making great leaps—a spring of twenty feet not being uncommon. The general color of the body is a light dun brown, the fur on the belly being much lighter and longer than on the back. Except for mountings and rugs the skins have little value at present, though at one time they were used for carriage robes. The color changes with age until it becomes a silvery fawn in the older animals.



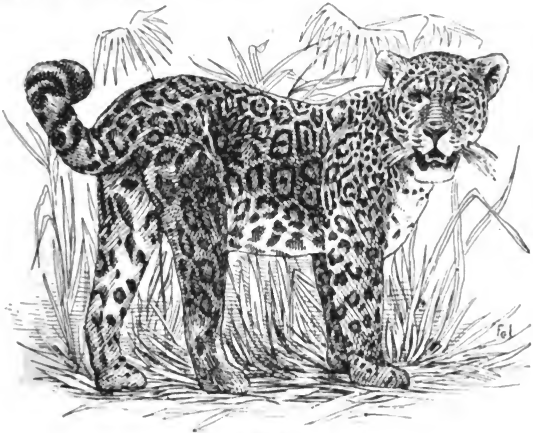
PUMA OR COUGUAR.

It is said to be swifter, deadlier, more subtle and more voracious than the Jaguar. The Guanaco is its favorite prey; but the Viscachas also are the victims of its insatiable appetite and thirst for blood, and in consequence of the terror with which it inspires them these creatures have become wild to excess.

JAGUAR.

The Jaguar is about as large as a timber wolf, and in strength and ferocity resembles the royal Bengal tiger; but unlike the tiger it is an agile climber, although it has a massive and heavy appearance.

The general color of the Jaguar is a light yellowish brown, beautifully marked with chocolate brown or black roset rings, which with the exception of those on the head and tail generally have a small black spot in the center. The hair is short, but longer than that on the East Indian Leopard, and is almost white on the under part of the body.



JAGUAR.

"It is a merciful dispensation of Providence that animals like the Jaguar, Puma, Tiger and Lion are not gregarious, but hunt singly or in couples. If they herded like wolves whole provinces would be depopulated by their ravages; but as it is they can be destroyed in detail and their numbers kept within bounds while their depredations are confined to their native jungles."

The Jaguar is found in Mexico, British Honduras and most parts of South America with the exception of Chili and Peru.

THE TIGER.

Handsomer in color and markings but not as majestic in appearance as the Lion, the Tiger is said to fully equal if it does not excel in strength the king of beasts.

As is the case with many mammals the general color of the Tiger assimilates itself to the color of the country in which it lives; and in the reedy jungles of India its stripes are so difficult to distinguish, that it is often fully upon people before they are aware of its presence.

Most tigers will avoid a man, but some species watch for human victims upon the highways, and at night even enter the settlements to secure their prey. At one time it was no unusual thing for whole villages to be abandoned because of the terror inspired by these ferocious creatures, but the number of these "man hunters" has been greatly reduced by the "shikarees" employed by the local authorities to destroy them, and by those who have pursued them to secure the bounty offered by the British Crown for Tiger Skins.

Some scientists class the Mongolian Tiger and other varieties of this animal found in Sumatra, Java, Corea and the Maylayan Peninsula as belonging to a number of different species, but in spite of some marked differences in external appearance they are all local varieties of the Felis-tigris.

There are really only two marked and distinct varieties of this animal; the Bengal Tiger, and the Mongolian or Chinese Tiger. The Turkistan or Himalayan Tiger, while its coarse fur is deeper and redder in color than that of the Chinese Tiger, and sometimes even has brown stripes, cannot be considered as a separate variety, the differences noted being probably due to its more exposed habitat in Turkistan, and on the high grounds of Asia and the western Himalayas.

To protect it from the cold of its elevated habitat the Mongolian Tiger is covered with a rich, thick fur from one and one-half to two inches in depth, instead of the short hair which forms the coat of the Bengal Tiger; and is thus easily distinguished from the latter variety. The skins are sometimes beautifully marked, but in general color they are lighter than those of the Bengal Tiger, and the stripes are not as black and numerous.

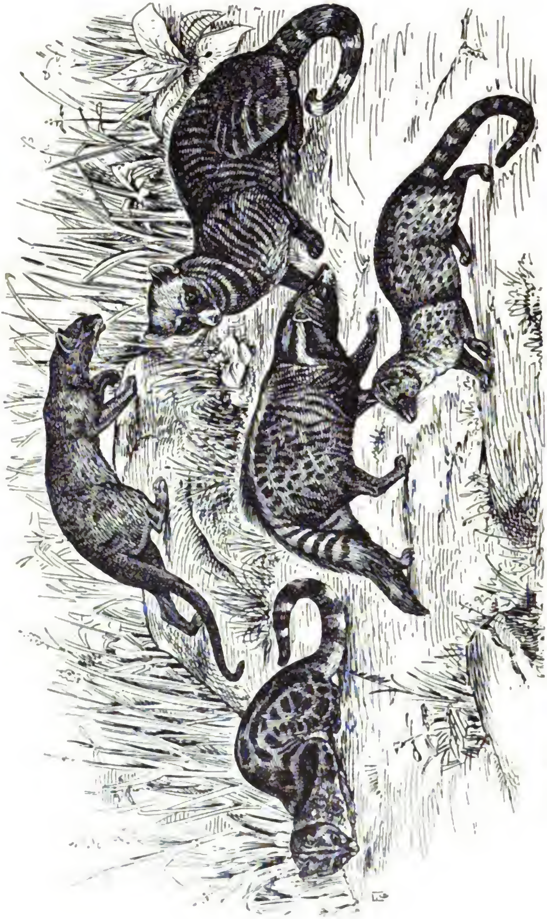
White Tigers with light brown stripes are rare but exceedingly beautiful.

The face of the Chinese Tiger, like that of the lynx, is surrounded by a long, deep fringe of white and black fur; and on many of the animals there is a hump of longer and thicker fur between the shoulders than on the rest of the body, and on all of them there is a thick ridge of bristly hair running down the back the same as on the lynx and other species of the cat family. On many of the younger animals the color is sometimes pale, but the larger adults are mostly of a fine, rich brown color, approaching the deep hue of the Bengal variety. The cubs have the densest coats. The ears of the Tiger are black with white tips.

The Bengal Tiger is the smaller and more numerous of the two varieties, and is distinguished by the brightness of its markings. The strongly contrasting colors of the head are white and black. The belly is white, but the general color of the body is a rich reddish brown striped with black, with well defined spots sometimes showing between the stripes, especially on the legs. The tail is long and ringed with black. The strong bristling whiskers are white, and the hair of the body is short and lies very close to the skin.

The skins of the Bengal Tiger have a more uniform value than either of the other varieties. The Himalayan tigers are sometimes worth from two to four times as much as the Bengal, and a fine Mongolian skin that is large and perfect is ten times as valuable. The skins of the different varieties are principally used for rugs. Only a small proportion of the Bengal skins find their way into the market, most of them are kept as trophies by the English officers and others who secure them; and the skins of the animals killed by "shikarees" are generally sold to tourists, who exhibit them to admiring friends at home, as evidences of their courage and prowess.

The Bengal Tiger rarely exceeds eleven feet in length including its tail, but the skins of the Mongolian Tiger sometimes measure as much as fourteen feet.



COMMON GENET. FOSSANE. PARADOXURE.
AFRICAN CIVET. RASSE.

THE CIVET FAMILY.

The Civets occupy a position between the Felidae and the Hyaenidae. They have much more elongated heads and longer muzzles than the Cat Family. They have forty teeth. The tongue is bristled with sharp, rough papillae. The true Civets (The Viverra) all have large forms and robust bodies from two to three feet long, exclusive of the fifteen inch tail, and walk on the tips of their toes. Their legs are short, and each small, rounded foot is furnished with five toes the claws of which are partially retractile. Although their eyes remain round and full in the day they are nocturnal and solitary animals, hiding in the woods, bushes or thick grass during the day time, feeding on snakes, frogs, insects, eggs, fruits and roots, and going out at night to kill any small animals they may find. They take readily to the water but most of the species are poor climbers. The young are produced in May or June, three or four at a birth.

The fur is ash colored, irregularly barred and spotted with black; the tail is black at the end and has four or five black and white rings near its base. Two black bands encircle the throat and one surrounds the face; a black mane runs along the whole length of the spine. The fur of most of the species, however, is of little value.

The Civet Cats are of interest commercially because of a musky substance which is obtained from a deep, two sac pouch situated near the anus of the animal; this secretion oozes into the pouch from peculiar glands, and is obtained by the natives of Abyssinia and Java by scraping the inside of the pouch with a spatula. A dram is often secured by one scraping and the operation can be repeated at short intervals. As this civet, as the substance is called, sells for ten dollars an ounce to the perfumers who use it as a base for perfume extracts, it will be seen that it pays to domesticate these animals even though they are irritable and untrustworthy. The Civet Cats are dangerous animals when aroused, and as they produce more of the secretion when angry they are generally confined by those who cultivate them in a cage so long and narrow that they are unable to turn around when the spatula is being used to obtain the secretion.

The habitat of the Civet Cat is confined entirely to the Eastern Hemisphere, the majority of the species being Asiatic though some are found in Africa. The Asiatic species (Viverra-zibetha) can be distinguished from the (Viverra-civetta) of Africa by the black half-rings extending the whole length of the tail, black bands on the side of the neck, and the absence of a mane.

This animal should never be confounded with the little striped skunk of North America, the so-called "Civet Cat" of commerce, which is fully described in its proper place in the weasel family. The Chinese Civet is not only an entirely different animal, but its coarse, harsh fur is of a different color, and the skins, of which quite a number are consumed, are only used where price is the primary consideration.

In China and on the west coast of Africa this animal is also known as the Bush Cat, and the Chinese species are called Chinese Civets by the furriers.

In the Genets (Viverra-genetta), the pouch is reduced to a slight depression formed by the projection of the glands, and has scarcely any visible secretion although an odor is diffused from it that is very perceptible. The pupils of the eyes of the Genet form a vertical fissure in the light and the nails are completely retractile as in the Cat. It is also distinguished from the Civet by the slenderness of its body, a longer and more tapering tail, shorter and blunter claws, and the nature of its fur which is short and soft, brownish yellow or greyish in the ground, and blackish brown on top. These animals are easily tamed, and in the south of Europe the (Genetta-vulgarus) or Common Genet is often kept in the houses for killing rats and mice.

The Common Genet (Genetta-vulgaris) is grey, spotted with black or brown, and has a blackish muzzle. It has white spots on the brows, cheeks, and on each side of the end of the nose; the tail is the same length as the body and annulated with black and white, the black and white rings being from nine to eleven in number. It is the only species of Genet now found in Europe, and its range is from the south of France to the Cape of Good Hope. In the different localities it varies in the size and the number of the spots in the bands along the shoulder and the neck, as well as in the lines on the nape of the neck. It frequents the edges of parks near springs. The skins of different species of this animal are used more or less at all times by furriers, but the fur generally sold under the name of Genet is that of the European Black Cat, which in Holland, Denmark and Holstein has a beautiful dense brownish black pelage that is soft and durable, and especially suited for coat linings because the skins are very pliable and light in weight.

The Blotched Genet (Genetta-tigrina), is found only in Africa, and is lighter in color than the Viverra-civetta, and marked with blotches, instead of spots. The tail is marked with six to nine dark or black rings; and a white mark on each side of the mouth is another distinguishing feature of this animal.

Those whose habitat is nearest the equator are darker than those found in other parts of Africa, and they are called Pardine Genets; but they are simply a variety of the same species.

The Fossane of Madagascar has its tail, flanks and all above fawn color; the legs and all beneath being a yellowish white; there are reddish brown spots, forming four longitudinal bands, on the back; the tail is semi-annulated with red and is only half the length of the body.

The Paradoxure, also known as the Palm Cat of India, is only found in west Africa. It is about twelve inches long with a tail two feet long. It has the teeth and most of the characteristics of the Genet, with which it was for a long time confounded; it is however more stoutly limbed; its feet are semi-palmate and its walk is nearly plantigrade; but what particularly distinguishes it is the spiral inclination of the tail, which is not prehensile. The color is yellowish brown, with spots of a deeper brown; the face, muzzle and part of the tail are blackish; the eyebrows are white, and there is a white spot under the eye.

The Rasse (Viverra-mallaccensis), also known as the Malaca Weasel, and Lesser Civet, has a greyish brown body about 10 inches long, with small brown spots on the rump forming five longitudinal lines. The tail is shorter than the body and annulated with black and white, the black rings numbering six or seven. The hair is harsher than in the preceding species. This animal is easily irritated, and has a sharp bite.

Ichneumon (Herpestes-ichneumon). This is an Egyptian animal which hunts out crocodile eggs, and is also known as the Tracker because like all the Mungoose it can track or trace out a footstep. It is a carnivorous animal, classed by Linnaeus as the (Viverra-ichneumon), but is now known as the Herpestes-ichneumon of the family Viverridae or Civet.

It has a slender form something like the Weasel. The body is about nineteen inches long, and of a grizzled brownish color. The muzzle and face are black and the tail is tufted; it feeds on small mammals, eggs, reptiles and small birds. It is easily domesticated, and is useful in destroying vermin. The fur has no commercial value, and the species is only mentioned here because of its connection with the Viverridae.

Another species of Ichneumon or Mungoose (Herpestes-grisius) is so easily domesticated that it is kept in many houses in India to rid them of reptiles, mice, etc. Though small, this Mungoose is absolutely fearless, and its movements are so rapid that the snakes it attacks have no chance to poison it. It is grey in color, flecked with black and about the size of a small cat.

THE DOG.

The origin of the dog is a difficult question to answer. Some think it is descended from the wolf, and others claim the jackal is its progenitor; but all admit there is no trace to be found of it in a primitive state. Scientists are all agreed however that "the dog is neither a species, nor the descendant of any one species modified by domestication, but that dogs of different parts of the world have a correspondingly various ancestry from different wild species of the genus Canis, such as wolves, foxes and jackals."

"The differences between dogs, and the readiness of most of them to cross with their wild relations, seems to prove the contention that the name Canis-familiaris is a convention rather than a proper zoological designation of the dog as a species."

It is hard to arrive at a satisfactory classification of domestic dogs; as those that some naturalists regard as types are held by others to be mongrels. One old classification divided them into three groups, according to the special qualities they possessed—Celeres, Sagaces and Pugnaces; but Col. Hamilton Smith groups the domestic dogs into six divisions; (1) Wolf Dogs; such as Siberian, Eskimo, Newfoundland, Great St. Bernard and Sheep Dogs; (2) Watch and Cattle Dogs; like the German Boar Hound, Danish Dog and Dog of the American Indians; (3) The Greyhounds; including the Irish Hound, Lurcher and Egyptian Street Dog; (4) Hounds; taking in the Blood Hound, Stag Hound, Fox Hound, Harrier, Beagle, Pointer, Setter, Spaniel, Springer, Cocker, Blenheim Dog and Poodle; (5) The Curs; under which designation are included the Terrier and all its allies; (6) The Mastiff, Bulldog, Pug-dog, etc.; but all these varieties soon lose their distinctive characteristics if they are left to interbreed, and to prevent this tendency to reversion it is necessary that the several strains be kept pure by artificial selection along the lines of desired specialization. The best bred dogs of every form are those furthest removed from an organic or common type of production.

"All through the different varieties the difference of heredity is seen in the readiness with which dogs interbreed with one another, and cross with wolves, foxes, and jackals; and the readiness with which like the cat, they return to the wild state of their native ancestors."

Where so many are worthy of special mention it is hard to pick out a few for particular consideration; the following are selected only because they seem best to illustrate the great difference between the various breeds of domesticated dogs as to size, color, structural characteristics, nature and habits.

The Chinese Dog, which is the most important commercially, is about the size of a large Retriever and shows much variation in color, some specimens being white, others black, and many mottled or brindled. In addition to the wild animals of this species there are thousands of small dog and goat farms all over Manchuria and the Eastern borders of Mongolia, on each of which from a score to a hundred dogs are reared annually. Most of the Chinese dog skins are dressed and made into robes of from four to eight skins before they are exported from China to the different fur markets of the world. The Chinese dog skin takes a brilliant black dye, and is used in the manufacture of "Chinese Lynx" muffs and neck pieces, as well as for making sleigh robes and men's overcoats.

The Dalmatian or Coach Dog is an artificial breed, and is built much like the pointer, but its white coat is liberally marked with black spots. This animal is worthless for any other purpose than running under the carriage of its master.

The Dingo (Canis-dingo) is a fierce, wild, wolf-like Australian dog, with short erect ears, and a bushy tail. It is about three feet long, and in general color either a reddish brown, black, or brindled like a wolf. It breeds well in confinement, but in its wild state is very destructive to flocks, and is consequently persistently hunted. The skins are of little value.

The Eskimo Dog, of North America and Eastern Asia, with its deep dun color marked with darker patches is used only as a beast of burden in the Arctic regions, where a team of these animals will draw the Eskimo sixty miles over the ice in a day. It is characterized by its black eyes, elongated muzzle and bushy tail.

The Maltese Dog with its long white, silky hair and round muzzle is one of the smallest representatives of the family, and is principally valued as a household pet.

The Typical Newfoundland Dog is one of the largest and handsomest dogs. It has a long, broad muzzle, carries its head well up, and has wavy or curly black and white hair, and a bushy curled tail. It is noted for its sagacity, patience, good nature and affection for its master; and in Newfoundland, and other parts of its habitat, is made to draw sledges and wagons loaded with fish, firewood and other supplies of various kinds. There is a variety of Newfoundland Dog that is almost all black.

The Raccoon Dog is found in China, Japan and throughout Northeastern Asia; but most of the skins taken from this species are exported from Japan. It is a lively animal, only about a foot in length, and the skins are sometimes sold as "Jackal," "Chinese Badger," "Sea Fox" or "Japanese Fox." The Chinese call it the Kju Hao Tze, and in Japan it is known as the Tanuki. The general color is a dark brownish grey, the soft thick underfur being of a light reddish hue, while the long, bristly top hairs are black. There is a white stripe over the eye, and sometimes a dark mark across the shoulders like that on a cross fox. The ears are dark brown, and the short tail is occasionally tipped with white; rarely a white spot is seen on the dark covering of the short legs. The skins are used in their natural state, or plucked and dyed, for making trimmings and fur sets.

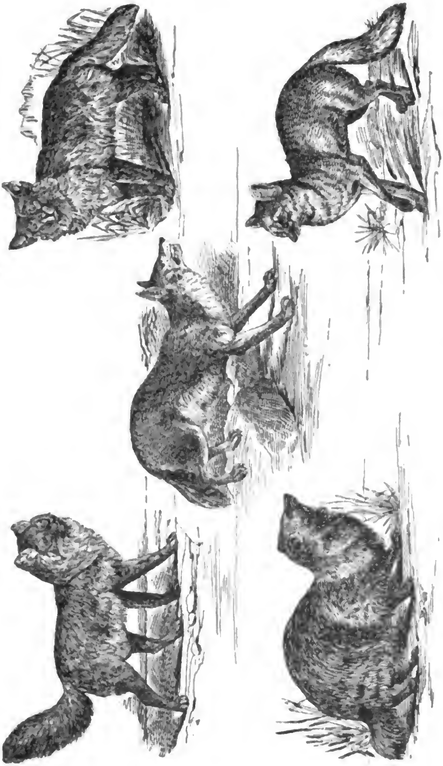
The Siberian Dog is a larger animal than the Chinese, and has a finer and more valuable skin. It is usually black, so that many of the skins can be used in their natural color.

In the Oriental countries, where the dog is a scavenger, performing the same work as the vultures, it is not prized as it is in western lands, but is regarded as a thing unclean. The Pariah dog, half wild, half starved and belonging to no one, but subsisting by scavenging and theft, infests every town and village in India.

Civilized nations have acquired many breeds of dogs by direct importation, and other varieties have been secured by crossing and artificial selection, but some strains have been introduced into countries, where they were before unknown, by savage and half-civilized people, who in their migrations have carried with them the breeds they had obtained by domesticating the wolves and the wild dogs of their native country.

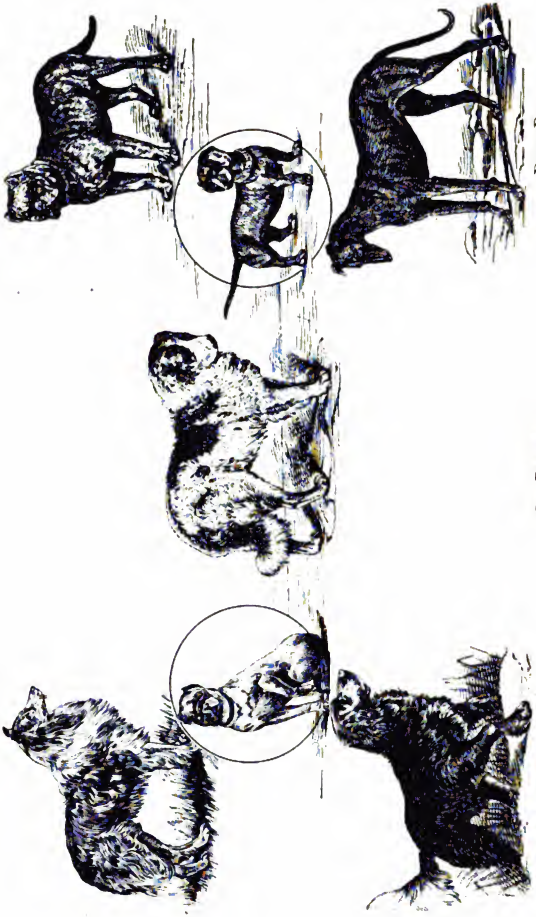
All the living representatives of the Dog family, in which are included the Dogs, Foxes and Wolves, are so much alike, and resemble one another so much in structure, habits and distinguishing characteristics, that scientists have placed nearly all the species in a single genus. Canis. The teeth of the dogs are much less carnivorous in character than those of the cats, and their legs are larger and more free from the body so they can walk erect upon their limbs, and are adapted for running rather than springing or climbing; as a rule they have five toes upon the fore and four upon the hind feet, the development of the rudiamentary fifth toe showing considerable variation in the different species. The claws in time become worn and blunt at the top because they do not have the slightest power of retraction. The inner toe of the fore feet is placed high up, and in some cases is lacking. The normal number of teeth is forty-two but one or two species have an extra molar on both sides of each jaw, and a few have less than the normal number. There is a remarkable resemblance in the sectorial teeth of all the species, the Azara's Dog (Canis-jubata) of South America, and the Raccoon Dog (Canis-procyonoides) of Japan, who live largely on fruits and roots, having the same pattern of sectorial teeth as the more carnivorous forms.

The difficulty of classifying the Canidae is increased by the great range of variation in each species; but apart from some structural peculiarities the foxes can be distinguished from the dogs and wolves by their bushy tails, elongated pupils, erect acute ears, and longer muzzles. The skulls of the largest grey and red foxes are inferior to that of the average Jackal, and those of the smaller species of Foxes are less than half the length of an average Wolf skull.



SIBERIAN WILD DOG. INDIAN WILD DOG. AUSTRALIAN WILD DOG (DINGO).

RACCOON DOG. AZARAS DOG.



COLLIE.
PUG DOG.
IRISH SETTER.

ST. BERNARD.

BULL DOG.
DACHSHUND.
ENGLISH GREYHOUND.

THE FOXES.

There are four distinct species of North American Foxes; the Western Kitt or Swift Fox (Canis-velox), the Grey Fox (Canis-virginianus), the Red Fox (Canis-fulvus) and the Arctic Fox (Canis-lagopus). There are two varieties of the Arctic Fox—the Blue Fox and the White or Polar Fox. The Black, Silver and Cross Foxes are all color varieties of the Canis-fulvus, naturalists claiming that the only difference they show is in the fur. Other writers say that, as these varieties are only found in the Northern districts, they should be considered as a separate species from the North American Red Fox whose habitat extends well into the Southern portion of the hemisphere, but as they all interbreed, and pups of the various colors are sometimes found in the same litter, the scientists are justified in placing them all in the same species. Even the Red Fox shows considerable difference in size, markings, color, and the quality of the fur in different localities; those from Nova Scotia, Labrador, the Hudson Bay Country and other Northern sections being larger, and having longer and richer colored fur than that on the representatives of this variety found in the Northern and Central portions of the United States; where they are most abundant in the New England states, although they are found also in New York and Pennsylvania and as far south as West Virginia and Virginia. In the far Western States and on the Pacific Coast the Grey Fox takes the place of the Red Fox.

Silver and Black Foxes are occasionally met with in all parts of Canada and in the most northern of the United States, but they are not found in any considerable numbers south of Newfoundland, Labrador and the northern portions of the provinces of Quebec and Ontario. These varieties are also quite plentiful in the interior of Alaska, and the Yukon province of Canada where their range is lost in that of the Arctic Fox. The Arctic Fox is a bluish mauve color all the year around, in the lower latitudes of its habitat, but according to some authorities, in the far north it becomes white in winter, when it is known as the White or Polar Fox; others claim that the White and the

Blue Fox are district varieties, but that the White Fox becomes dark in summer. We are inclined to accept the latter theory. The range of the Cross Fox is the same as that of the Black and Silver varieties, except that it extends further South in the United States.

On the Pacific Coast the Grey Foxes are found only in California and Oregon, but they are plentiful all through the southern and south central states, and in the east are met with as far north as Connecticut. The habitat of the Kitt Fox is on the prairies and plains of the far west and southwestern states.

The mating season of the Red Fox is in February or the beginning of March, and the young, from five to nine to a litter, are born in April or early May. The mating season of the Grey Fox is later and its young are produced in May. This species is not as carnivorous as the Red Fox, and fruit, corn and fish form a larger part of its diet. The Arctic Foxes, who in their natural state subsist chiefly on Lemmings, and in some parts of their habitat on the carcasses of the Seals that have been killed for their fur, take very kindly to a vegetable diet in their captivity. The Grey Fox prefers the wooded districts for its home, but the different varieties of the Canis-fulvus are inclined to the more open country, although all North American Foxes, with the exception of the Kitt or Swift Fox, take to the rough hilly country rather than the level plains.

Red and Grey Foxes do not mix. In the sections where both species were at one time plentiful the Greys have in some instances driven out the Red, while in others the Reds have dominated and surplanted the Greys.

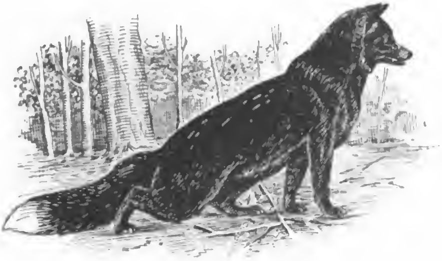
In Virginia and the other southern sections of its habitat the North American Red Fox attains its deepest coloring, but the animals there are much smaller than those seen in the northern part of its range: the bellies of this variety are sometimes white, but usually black; the long bushy tail is of lightish brown color with longer black hairs on the top, and it has a white tip. The whiskers are black, and the ears are covered with a short black velvety fur.

The largest of all Red Foxes inhabit the Kadiak Island. Their skins are three feet long exclusive of the tail, but the color is pale and the quality of the fur is coarse. The

Kamschatka Fox surpasses all other varieties in the fine quality of its fur, and the depth and richness of the red color. Some of the Mongolian red foxes are of good quality, but most of the skins received from China are coarse furred and yellowish in color. The Japanese Fox is similar to the Chinese, but the color is somewhat deeper, and since the increase in the value of American Foxes the skins of this animal have been quite extensively used. There was a time when the skin of the Red Fox was the chief medium of barter in Northeastern Asia, the same as the Beaver skin was in America.

Young Foxes are covered with a soft, downy, yellowish grey fur at birth, the orange colored hair not beginning to appear until they are five or six weeks old. Even the Indian hunters cannot distinguish the pups of the Red Fox at an early age from those of the Cross or Silver Foxes.

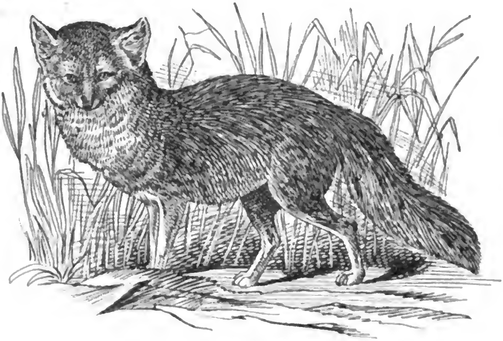
All Foxes have the soles of their feet covered with wool pads in the winter, no callous spots being then visible.



SILVER FOX.

In point of value as well as beauty the Black and Silver Foxes come first. The Arctic Foxes come next, then the Cross, and last the Red variety. All the Foxes of this species are hardy animals, cunning and suspicious. They spend but little of the time in their dens on the sandy hill sides, preferring to pass the day curled up among the grasses or weeds, or in a clump of brush, or on the top of a stump.

They hunt their food at night, being most active in the early morning when all animal life is on the move, and they have a better chance to secure the small animals and birds with which they vary their diet of fruit, nuts and eggs.



GREY FOX.

In the wild state foxes are monogamous. The male has only one consort in a season, and while the young are being reared he dutifully forages for them. In confinement however one male sometimes has been mated successfully with two or even three females.

When born the young are small and weak, but if all is well they grow rapidly, and when about six weeks old begin to come out to play and to lap a little milk, or to take an occasional bit of solid food. If allowed to do so they will continue to nurse for nearly six months. They breed the first season when a little less than a year old, but usually produce only two or three young.

Foxes may all be distinguished from the Wolf or Dog by their longer muzzles, and longer and more tufted tails. Their upper incisors are also less sloping, and the pupils of their eyes form a vertical fissure during the day. They all diffuse a more or less fetid odor, dig burrows, and are the most timid of the dog family, attacking none but the weaker animals.

As before stated, "in the red phase the Fox is entirely rich fulvous, except restricted black markings on the feet and ears, a white area at the end of the tail, and certain white-tipped hairs on the back and rump. From this phase to the next the black increases in extent, until in the typical cross fox the black predominates at the feet, legs and under parts, while fulvous overlaying black covers most of the head, shoulders, and back. A gradual increase of the black and elimination of the fulvous, or its replacement by white, brings us to the next phase, the silver or silver-grey in which no fulvous appears, the entire pelage being dark at the base and heavily or lightly overlain with greyish white. Silver foxes vary from those in which the color is entirely grizzled, to those in which it is entirely black, except a few white-tipped hairs on the back and rump. Finally, in the black phase, the white is absent from all parts except the tip of the tail, which is white in all phases. The red phase is much more abundant than the others, but the three interbreed freely, and wherever one occurs occasional examples of the others also may be expected. In general the cross fox is fairly common, the silver-grey is comparatively scarce, and the pure black is excessively rare. The prices usually paid for skins of the different phases vary according to the relative scarcity of the animals. Thus red fox skins command only a moderate price, cross foxes are somewhat higher, silver foxes are many times higher, and pure black skins are exceedingly valuable being higher priced than any other fur except sea otter."

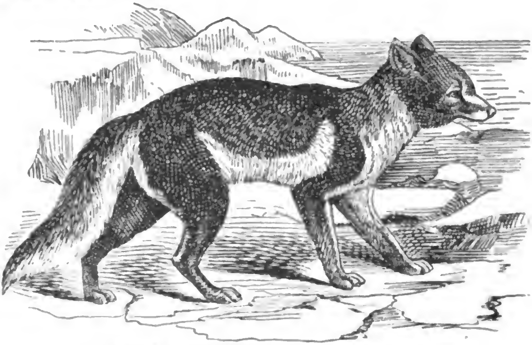
It is believed that the Arctic or Blue Fox was not found on the Pribilov Islands at the time of their discovery in 1787, but that it was taken to those islands subsequently, and under the fostering care of the government the herds on these islands have not only grown strong numerically but produce exceptionally fine skins. They are therefore very desirable for breeding stock and can be obtained from the Secretary of Commerce for that purpose, sales being made from time to time under competitive bids.

Blue Fox skins from the Pribilov Islands have been marketed for many years, some idea of their quality may be formed from the fact that three hundred and ninety-one Blue and White Foxes taken on the islands in the winter of 1911-12, netted the government $20,505.17; one lot of twenty-eight skins bringing $3,675, or an average of more than $131 per skin.

In the chapter on Fur Farming considerable space is devoted to Silver Fox breeding, but no mention is made of successful attempts by different individuals to raise Blue Foxes on the islands off the coast of Alaska. In a recent announcement the Secretary of Commerce said that he intended to lease twelve islands on the coast of Alaska for five years, to the highest responsible bidders who would engage in the business of rearing this species, and agree to pay an annual fee of not less than $200.00.

The islands which it is proposed to lease are those which which had been leased by the Secretary of the Treasury for fox propagation purposes prior to May 14, 1898. They are Chirikof island, Long island, Marmot island, Little Koniuji island, Simeonof island, Little Naked island, Carlson island, Middleton island, Pearl island, Elizabeth island, Aghiyuk island and Chowiet island.

Leases will only be given to American citizens, and companies or corporations organized under the laws of a state or territory, and detailed reports must be made by the leasees annually to the Secretary of Commerce. Further particulars regarding the conditions that must be complied with to secure a lease of one of these islands can be obtained by addressing the Secretary of Commerce, Washington, D. C.



WHITE OR POLAR FOX IN SUMMER DRESS

As the fur of the White or Polar Fox is much less valuable than that of the Blue or Arctic Fox, breeders should always be careful to eliminate from their breed of Blue Foxes any individuals that show any tendency toward the white fox variety.

Wilfred H. Osgood of the U. S. Department of Agriculture, says: "Cold weather has no terrors for Foxes, and snow is their delight. In confinement, as in their natural state, they show considerable individuality. Some are much better breeders than others; some can never be induced even to mate, and others mate but do not produce young. Their wild nature dominates most of their actions, and it is rare that one becomes really tame. They are constantly in a state of fear, and it is only by the greatest care that confidential relations can be established between them and their keepers.

"Hope for increased profits in fox raising lies almost entirely in improving the stock by selective breeding. The darker the animal the more valuable its pelt. Hence the object of every breeder should be to produce pure black foxes, or as nearly pure black as possible. To do this he must retain his darkest and most valuable animals for breeding, selling only the poorer ones. The temptation to sell animals of high value is often very great, but in the long run such animals are likely to be more profitable if kept for breeding. The possibilities of modification and improvement by selection are fully as great with wild animals as with domestic. This has already been demonstrated in the case of foxes. Some of the highest priced fox skins ever put on the market have been from animals reared in confinement and improved by selective breeding.

"Breeding for disposition is perhaps fully as important as breeding for color. So far this has not been attempted to any extent, but evidently it may be of great importance in overcoming some of the principal difficulties now encountered. By selecting those animals which show the least aversion to man, due regard being paid to prolificness and other qualities, a strain may be obtained which will breed with the certainty of our domestic animals. This in time should produce a thoroughly domesticated race of foxes, a result of inestimable value, amply justifying the utmost efforts. Although it may not be fully accomplished by those who begin it every breeder should keep its importance in mind, for every slight improvement will be to his advantage, and in the end the unqualified success of the business will be assured.

Besides the prominent species that have been mentioned in this article, there are a number of other foxes of more or less importance commercially at the present time.

The Prairie Fox of the central states is smaller than the Kitt Fox, of which species it is a variety although its dense fur resembles that of the Grey Fox. It has a black tipped tail.

The Brazil Fox is also grey in general color, but the sides of the neck are reddish and it has a black line commencing at the nape of the neck and extending to the middle of the tail.

The Patagonian Fox is fawn color on the flanks but has red ears and feet, and two-thirds of its tail is black.

There are two varieties of the Vulpes Leucopus, whose range extends from the Volga to India. The Hill or Stone Fox, also known as the Cossac, Steppe and Afghan Fox, which inhabits the high table lands of Asia, is of medium size and has a long, soft, very light brown fur, that in some cases becomes a darker shade on the back and rump, causing it to look, with its black belly, ears and legs and white tipped tail, something like the American Cross Fox. The East Indian Desert Fox is very small and lighter in color than the Hill Fox, and has white silvery hairs on the back.

African Foxes are remarkable for the size of their ears; one species that burrows in the sands of Nubia is an almost white fawn color; the Cape species are yellowish grey above and whitish beneath, and have black feet and tail and dorsal line.

The Asiatic Kit Fox, called Ture by the French because it is the same color as the Turkish Fox, is a small animal measuring from eighteen inches to two feet in length. The under fur of the back is light grey relieved by longer white hairs; the sides are light yellow and the belly is white; the ears are brownish grey and tipped with black, and the twelve inch yellow and grey tail is also tipped with black hair; the whiskers are black. Its burrows are always seen on the open plains. Mr. Say claims that it exceeds even the antelope in swiftness, and is consequently known as the velox species of the genus vulpes.

WOLVES.

In America there are two distinct species of Wolves; one of them the Grey Wolf with its grizzled grey coat showing reddish in some specimens and black in others, is almost identical with the European Wolf, but most of the strains of the American Wolf are larger and stouter than those of the European species. The Grey Wolf is also called the "Buffalo Wolf" because of its former abundance in the buffalo country, and is generally known as the Timber Wolf to distinguish it from the Prairie Wolf or Coyote, a much smaller animal that lives in the open country and in some ways resembles the Jackal.

GREY WOLF.

The Common Wolves of Europe (Canis-lupus), stand from twenty-seven to twenty-nine inches at the shoulders, and are yellowish grey in color, with long harsh hair, erect pointed ears, and a nearly straight tail. They are crafty and rapacious animals, swift of foot, and destructive enemies of the sheep fold and farm yard. They associate in packs to hunt the larger quadrupeds like the deer and elk, and when pressed by hunger will attack isolated travelers, having even been known to enter villages and carry off children; but they are cowardly and sneaking in their advances, retreating rapidly if disturbed by a man or dog, and showing great cunning in avoiding traps. They are still numerous in France, Hungary, Spain, Turkey and Russia, but became extinct in England in the Fifteenth Century, and disappeared from Scotland and Ireland in the early part of the Eighteenth Century.

"There are numerous other species of Wolves in different parts of the world. Some like the Thous grading into jackals; others like the Fox Wolf inclining more toward the foxes; and most of them interbreed easily with some varieties of the dog in the countries they inhabit, the dog itself being a composite of a mixed wolf ancestry.

Many stories have been told about the ferocity of the Wolves, and when food is scarce in the winter they are doubtless dangerous animals to meet when they are traveling in packs; but the writer has heard the Coyotes howl all night without offering to come within gunshot range when the bright fires burning in the camp told the cunning animals that a warm reception was awaiting them. It is claimed however that the common Wolf of Europe is of a bolder and fiercer disposition than any of the American species, and the reports that come to us from time to time of thrilling adventures of sledging parties in Russia support this contention.

The Russian or Black Wolf is larger than the other European varieties, which are about the size of a large dog. and has long black top-hairs with a thick brownish red underfur, bluish at the ground. The full tail is of medium length dark brown above and light below and has a black tip; the ears, which are generally dark brown, are covered with a soft velvety fur; and the black whiskers are few in number. **The Siberian Wolf** is larger still than the Russian variety, and is of a much lighter color and has much harsher fur.

The American Grey or Timber Wolf (Canis-lupus-occidentalis), found in the wild regions of North America as far north as twenty-seven degrees north latitude, is fully as large if not larger than the Siberian Wolf.

It is from five to six feet in length, and in the extreme north grows to a still larger size. Those in the Churchill District of the Hudson's Bay Company have almost white hair, while those from the Eskimo Bay District are characterized by their bluish grey color although occasionally black and even fawn colored specimens are found there.

With the exception of the Alaskan variety, which has coarser hair, the American wolves have finer, denser and longer fur than the European species, and their skins are more valuable, especially those of the blue and white ones. They live in burrows with several outlets, where they bring forth their young in litters of from four to five or even nine. Dr. Richardson says: "The resemblance between the northern wolves and the domestic dog of the Indians is so great that the size and strength of the wolves seems the only difference. I have more than once taken a band of wolves for the dogs of a party of Indians; and the howl of the animals of both species is prolonged so exactly in the same key that even the practiced ear of an Indian fails at times to discriminate between them. The Indians do not consider the Black Wolf to be a distinct race, but report that one or two black whelps are occasionally found in a litter of Grey Wolves."

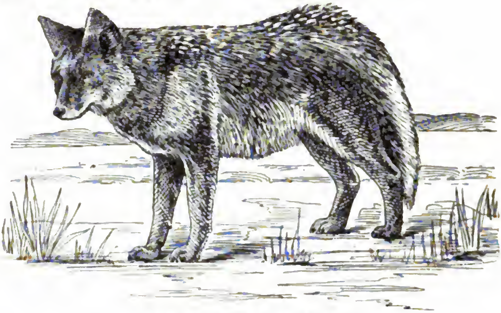
The American Timber Wolf has been observed as far north as twenty-seven degrees and has broad feet well calculated for running in the snow. The skull and dentition approach closely to that of the dog. In Alaska wolves prey on the Reindeer, and in other sections the Moose is often their victim, but they always seemed to fear to attack the Bison.

The Black Thibetan Wolf (Canis-pallipes), is really a climatic variety of the Common Wolf of Europe, but is classed as a separate species.

Chinese, Japanese, Indian (Canis-pallipes), and **South American Wolves** (Canis-antarcticus), are of little importance commercially. They are all small animals, and their skins are poor in quality.

The Coyote or Prairie Wolf (Canis-latrans), which is rapidly disappearing before the advance of civilization, is much smaller than any of the other important species of wolves. It was formerly abundant in many parts of this country and Canada where it is never seen now, but it still ranges the plains in the West and Southwest portions of the United States. It is a handsome animal, showing considerable variation in color from a grey with black tips to brown and black specimens. The tail is usually tipped with black, and the large reddish ears are also black at the points. The dense, long fur is rather harsh.

Although the Coyotes are generally classed by scientists as all belonging to one species, Dr. Merriam, from an examination of a number of specimens received from all parts of the United States, was led to separate them into eleven distinct species.



COYOTE OR PRAIRIE WOLF.

What the Coyote lacks in courage it makes up in audacity. W. T. Hornaday says: It seems to know when the hunter has left his gun behind, and on such occasions will boldly plant itself within a stone's throw of its enemy, and even when a man is armed it seems to know within a rod just how near it is safe to approach. It is a coward, and, "so far as man is concerned a band of a thousand Coyotes can be put to flight as easily as one animal; but in hanging on the ragged edge of civilization and living by its wits no one can beat the Coyote."

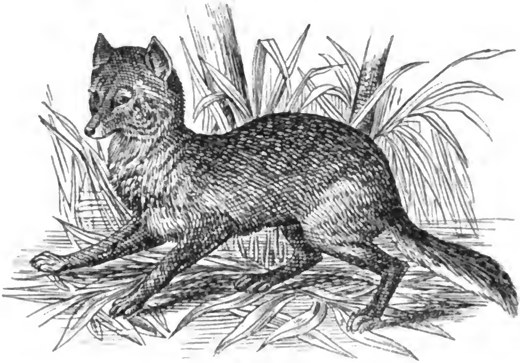
Wolf skins were formerly used only in their natural color for making sleigh robes and coats, but when the constantly increasing demand for muffs and neck pieces of long fluffy fur caused such a phenominal advance in the price of the lynx and fox, the furriers saw an opportunity to utilize the wolf to meet the constantly increasing call for good popular-priced long-haired furs. Wolf skins are now being dyed black, blue and other shades, and sold either for what they are or under some fictitious name. The finer grades make articles as beautiful as they are serviceable; but as the best Siberian Wolves are now worth from twelve to fifteen dollars each, and fine American skins are bringing as high as seven dollars, the manufacturers have to depend upon other and lower priced skins for their supply of "cheap" substitutes for Lynx and Fox.

Scandinavian Wolves are similar in shape to the Russian, but heavier, and deeper in the shoulders, and lighter in tint. In winter they become almost white. The wolves of Italy and southeastern Europe are fulvous, but in the Pyrenees a Black Wolf is found that is more common than the ordinary variety. The Wolves of France are smaller and browner than those of Germany, and the Indian Wolf approaches the Jackal in appearance more nearly than any of the other Old World wolves. The range of the wolf in the Old World extends from the German Sea to the Pacific Ocean, embracing all of Europe and the greater part of Asia. When wolves attack cattle they bite their hind legs so as to hamstring them, but their method of attacking a horse is to spring upon his back, or to seize him by the buttocks taking care to keep out of the range of his heels.

There is a difference of opinion among naturalists, as to whether the American Grey, and the European Common Wolf belong to the same species, but it is certain that the geographical varieties of both species differ more widely among themselves than the type forms of each do from one another, and it is safe to say that they are identical.

THE JACKAL.

The Jackals (Canis-aureus) are gregarious animals, hunting in packs and rarely attacking larger quadrupeds. They hide in the daytime and come out at night with dismal cries to feed on the remnants of the lion's prey, dead carcasses and smaller mammals and poultry. These animals are numerous in India, and Algeria where the French government pays a bounty for their slaughter and as high as thirty thousand are killed in a year; but the fur is harsh and of little value; they interbreed with the common dog and can be domesticated.



THE JACKAL.

The piercing, unearthly cry of a pack of Jackals prowling through a village at night is familiar to all who have lived in Orental lands, and is appalling to weak nerves.

The Wild Jackal emits an offensive odor, is about two feet long, and has a black sharply pointed nose. It is a lively animal and bites quickly and sharply. In color it is a light reddish brown shading deeper on the back than the other parts, and it is characterized by a small white mark on the throat. It has sometimes been called the "Lion's provider," because of the mistaken impression conveyed by some writers that it hunts prey for the King of Beasts.

THE HYAENAS.

The Hyaenas have three false molars above, and four below, all conical, blunt and singularly large; their superior carnivorous tooth has a small tubercle within and in front; but the inferior has none, presenting only two stout trenchant points. So powerful are the muscles of the neck and jaws of the Hyaenas that it is almost impossible to wrest anything from between their teeth, with which they are able to crush the bones of the largest prey. They are nocturnal animals inhabiting caves, and are extremely voracious, feeding chiefly on dead bodies, which they seek for even in the grave. A thousand superstitious traditions are connected with them, and among the Arabs their name is a symbol of obstinacy.

There are three distinct species of Hyaena, all repulsive animals. Owing to the shortness of their loins and the lowness of their hind-quarters they do not walk, but progress by a sort of quick shuffle, occasionally giving utterance to peculiar unearthly cries. They are as cowardly as they are ravenous, and hunt in packs for their food, whether it be carrion or living prey. Strange as it may seem these beasts can be tamed and even domesticated.

The Striped, or Laughing Hyaena (Hyaena-striata), includes most of Africa, and Syria, Mesopotamia, Persia and India in its range. It is about the size of a large dog, but its feet are redigitigrade with retractile claws. It has the prowling, nocturnal habits of all of its kind, hiding in caves during the day.

The Spotted Hyaena (Hyaena-crocuta), has its habitat in South Africa. It has a thin fur of light brown color marked with dark brown spots; and there is a ridge of longer hair between the shoulders. The tail is thin and bristling; and the head is round, with dark, prominent eyes.

The Brown Hyaena (Hyaena-brunnea) is also found in the south of Africa, where the inhabitants of the Cape call it the Shore Wolf which it resembles in size. Its pelage, which is darker than that of other Hyaenas, is from eight to ten inches in length on the back and sides. It is reddish in color, sprinkled with black spots.

The Earth Wolf of the Dutch (Proteles-cristatus), generally known as the **Aard Wolf,** is sometimes called the Hyaena by furriers; but it has weaker jaws, smaller teeth, and no tubular grinders in the upper jaw. It is about three feet long and is met with only in South Africa. Its thick and rather long under fur is mixed with still longer hairs; and the tail has long bristling black hairs. The color is a light brown, with black stripes running crosswise of the body. It has a slight mane of bristling hair.

The Hyaena is distinguished from the Dog, by the number of its toes, four to each foot. The Wild Dog of the Cape has the dental system of the Dog, and not of the Hyaena. Its form is long and thin; it is about the size of a Wolf; has a white and fawn-colored mottled fur, large ears with black tips. It is a gregarious animal, and frequently approaches Cape Town, devastating its environs.

THE WEASEL FAMILY.

(Mustelidae.)

As the human family is composed of different branches of varying degrees of intelligence, wealth and refinement; so the Weasel family is made up of six distinct groups differing widely from one another in commercial value, in exterior character, in coloration, in the structure of the teeth, and in other details; but they are all distinguished by the great development of the curved ridges of bone by which the lower jaw is held in place, and by the peculiar shape of the upper molar teeth. They are all carnivorous.

The typical forms of the species are characterized by long, slender bodies and short limbs, and none of them are very large, most of them being of medium or small size. Several of the Northern forms have a dark summer and light winter dress, differing in this particular from all other carnivores, except the White Fox. One of the Martens, and some of the Badgers, are remarkable for extreme brilliancy of color; and "warning colors," or contrasting bands of dark brown, or black, and white, make the American Skunk, and the Cape Polecat, conspicuous; but most of the members of the Weasel family are clothed with a fur of uniform dark tint. The family is widely distributed on all the great continents except Australia; it is also noted that none of them inhabit Madagascar. With very few exceptions members of the Weasel family are fierce and blood-thirsty; cases are recorded where they have followed rodents twice as large as themselves into their own burrows, and destroyed them there.

The first and most important group of the Weasel family is the Marten group; consisting of the Pine Marten, the Stone Marten, the Japanese Marten, the Indian Marten, the American Marten (H. B. Sable), the Sable, the Fisher, the Mink and the Kolinsky. In the second, or Weasel group, are included the Common Weasel, the Tayra, the Grison, and the Stoat or Ermine. The Polecats, Ferrets and Skunks constitute the third or Polecat Group. Under their own names, the Otter, the

Badger and the Wolverine, form respectively the fourth, fifth and sixth groups of the Weasel family.

The Civets, the Bears and the Raccoons are closely allied to the Weasel family; but there is no generic connection between any of them, and each must be considered as belonging to a separate family.

THE PAHMI.

The Pahmi (Helictis-napelensis or ferrogrisea), sometimes called the "Chinese Stone Marten" by the Leipzig skin dealers, is an animal whose skins have lately come into favor, and it is estimated that more than eighty thousand pelts were marketed in 1913, causing a marked advance in the price. The Pahmi is principally found in the Central Provinces of China, where it is also known as the "Grey Marmot." Different varieties of the genus showing considerable variation in color are also found in Nepal and Sikkin, and on the Island of Formosa. It is so closely allied to the Stinking Badger (Mydaus-miliceps) that the Germans have also named the Pahmi, Stinkdachs.

The under fur is thick and silky, but the glossy top hair is coarse. The top hair of the Helictis-napelensis is a dark greyish brown, with a distinct white line running down the middle of the back from the neck to the tail. A white band also goes nearly to the back on both sides, from a great white patch that covers the throat and chest like a baby's bib. The under fur is light yellow, and the coarsely haired light grey tail has a white point. The pelt is heavy. The Pahmi lives under ground, in burrows of its own construction, but does not hibernate in winter. It is probably the connecting link between the true badgers and the skunks, as it burrows like the former, and discharges a fluid after the manner of the latter, although it cannot throw it as far.

RUSSIAN SABLE.

The most important animal in the Marten group is the Russian Sable (Mustela-zibellina). By many it is considered merely as a variety of the Pine Marten, distinguished by the greater length and finer quality of its fur; but it also has a much more distinctly cone-shaped head, longer and stouter limbs and larger feet. Like all the members of the Weasel family, the Sable has a habit of walking almost entirely on its toes, and its short and compressed claws are capable of partial retraction. It has soft, thick fur, the top hairs of which are darker and glossier than the under fur; in fact, the value of a Sable as well as of the other Martens depends upon the color and density of the top coat. The skins of animals taken in the depths of the forests where the sun's rays never penetrate the gloom are almost black, and well nigh priceless in value; but ordinarily the color varies from a light to a deep chestnut brown, and is uniform, except for a reddish grey patch on the throat, and a mixture of black and grey on the cheeks and snout. The skins are worth from ten to two hundred and fifty dollars each raw. There are furs that cost more, per skin, than Russian Sable; but when the size of the animal is considered, its full length being from fifteen to twenty inches, exclusive of the seven inch tail, the Russian Sable is the most valuable of all fur-bearing animals.

The finest Sables are the large, wide stretched skins received from the Vitim and Olekma river districts, on which the long, glossy top hair is very full and black. They are almost equaled in quality by the Bargusin skins that are generally stretched a little more in the length by the trappers. The skins from Jakutsk are smaller, and have browner top hair, but they have very large and full silky tails. The Okhotsk Sables are smaller and browner still, but fine and full furred.

The large brown Kamschatka skins that come to the market stretched in the length, have many silver hairs in the top coat. The Nerschinsk Sables are also well silvered, but are coarser furred. Those from the valley of the

Yenesei are large and coarse and for the most part light in color.

Some long, thin-furred skins are received from the Altai mountain section, that like the large, coarse, light-colored skins from Nekolaievsk, Afghanistan and Turkistan, are only suitable for blending. Many of the small, wide-stretched, brown Sables from the Amur district are, however, well silvered and of a fair quality.

The range of the Sable originally extended from the Ural Mountains to the Bering Sea, and from the mountains on the southern border of Siberia to the 68th parallel north latitude. Now its chief haunts are in the mountain forests of Eastern Siberia and Kamschatka.

Sables should only be purchased where the buyer can have the fullest confidence in the representations of the dealer, as skins that have been taken out of season, or artificially darkened, are often palmed off upon the uninitiated as prime or natural.

The Sable is a nocturnal animal, averse to the presence of mankind, and inclining to the least known and most inaccessible parts of the country. It subsists upon hares, birds, fish and every living thing it can kill. Sables make their nests in holes in the trees, and bring forth one litter of four or five young each year. Formerly they were caught in traps; but now they are generally hunted with dogs who either run them down, or drive them into trees from which they are knocked with long poles into nets stretched to receive them. A hunter who succeeds in capturing twenty Sables in a season is considered lucky. Hunting the Sable in the midst of winter and tremendous snows is a dangerous task. Is is largely to the pursuit of this animal that we owe the discovery of the eastern provinces of Siberia.

HUDSON BAY SABLE.

The American, or Brown, Marten (Mustela-americana) is generally known as the Hudson Bay Sable; although strictly speaking, it is more like the Pine Marten than the Russian Sable in color and habits. It is found in the forests of North America in the Hudson's Bay district, and to some extent in Labrador and Alaska, and is sometimes met with as far south as the Adirondack Mountains in New York. It never ventures near the habitations of man; and while gentle in appearance, when it attacks an animal larger than itself it becomes as fierce as a tiger. One strange peculiarity about the Brown Marten is the fact, that while in some years as high as one hundred thousand pelts are taken, at other times they are very scarce; the periods of scarcity recurring at regular intervals of ten years.

The skins are at their best when the animal is taken in November, and are worth raw from fifteen to forty-five dollars each, some choice specimens even bringing as high as ninety dollars. The color of the fur is brown, but of a more reddish cast than that of the Russian Sable. As in the case of its European cogener the value depends upon the color, density and silky gloss of the top hair, rather than upon the nature of the under fur. The head and ears are grey, and the breast spot is yellow.

American Martens are generally taken in wooden traps set up in line by the hunters for miles across the country.

In Labrador Martens are large and rich in fur, but very scarce, the same is true of Nova Scotia. The skins received from Alaska are large, but the fur is coarse and light in color, occasionally being entirely white. The skins from the East Maine and Fort George districts of the Hudson Bay territory are the finest and darkest, some of them being almost black.

PINE MARTEN.

The typical representative of the Martens is the yellow breasted Pine Marten (Mustela-martes). Its range is in the higher latitudes of the Northern Hemisphere, but one species is found as far south as India and the Malayan region. It has a sharply-pointed muzzle with nose extending far beyond the lip, and ears that are thickly covered with fur on both sides. The length of the body is from sixteen to eighteen inches, and the bushy tail is from nine to twelve inches long. The fur is of a rich brown color at the top, with a reddish grey tint to the under coat, and a white, yellowish or bright orange patch on the throat. The soles of the feet have a thick coat of fur between the bare pads. This animal is arboreal in its habits and averse to the open country, but remains in the bosom of the forest ranging through the thickets, or creeping from branch to branch of the towering trees, where its sharp claws aid it in procuring a firm hold. When domesticated it is said Pine Martens will eat fruit, but in their natural state they subsist entirely upon mice, rats, moles, and poultry; and in the neighborhood of the sea they supplement this diet with mussels. They can be domesticated and taught to eat fruit.

The skins of the Pine Martens, like those of the Sable, are used principally either in the natural color or dyed for the manufacture of muffs and neck pieces. When blended it is hard to distinguish the fur of the Pine Marten from that of the Sable; in fact even in their natural color it is sometimes difficult for any one but an expert to tell some of the finer skins from Hudson Bay Sable.

BEECH MARTEN.

The white-breasted Beech or Stone Marten (Mustela-foina), is much more common than the Pine Marten; inhabiting the whole of central Europe, parts of European Russia, Asia Minor, and some sections of North America. Although a frequenter of woods and trees this animal is more often found among rocks and stones, and has therefore been called stein-marder, or stone marten, by the Germans. The fur is coarser than that of the other Martens and different in color; the roots of the fur being of ash color, the middle of chestnut and the points black, giving to the whole a greyish brown effect. The Turkistan and Afghanistan skins have beautiful, long, glossy black top hairs and very pale ashy under fur. They were once regarded as belonging to a distinct species, but are now considered a variety of the foina. The Beech Marten is bolder than the other members of its family, being frequently found in the neighborhood of human habitations, and sometimes even making its nest in an old barn or granary, although generally its abode carefully formed of hay and straw is found in a hole in a tree, or in a crannie between rocks. The young, generally four or five in number, are born early in the spring; and are blind for the first two weeks of their existence. The food of the Beech Marten consists of mice, rats, rabbits and all kinds of birds; and no dove cote, however lofty it may be, is safe when a Marten is in the neighborhood. Beech Martens make a mewing sound, not unlike that of a cat, and a pair of them in a tree may be heard quite a distance. They are exceedingly bloodthirsty, but they have such a fondness for certain kinds of fruits, like cherries and plums, that in some parts of the continent of Europe the trunks of fruit trees are washed with tobacco-juice, or petroleum, to keep them away.

Natural Stone Marten fur has not been very popular for some time, but many of the skins are being dyed to imitate blended Sable, and this creates a demand which serves to keep the price about normal.

Professor Rolleston thought that the Ailouvos of the Greeks was a white breasted Beech Marten. The darkest skins come from Spain, Italy and France; and the finest from Bosnia. Stone Martens are very numerous in Russia, but their fur is coarse and light in color.

The Japanese Marten (Mustela-melanopus) has a yellowish underfur, almost white.

INDIAN MARTEN.

The Indian Marten (Mustela-flavigula), is the handsomest member of the group. It is from twenty to twenty-two inches long, with a seventeen to twenty inch tail. It can be distinguished by its beautiful coloration. The fur is generally short, but longer on the animals caught on the Himalayas than on those taken in the Nilgiri section. The color of the upper part of the head, neck, rump, tail and limbs is a blackish brown or black, the middle of the back being of a paler brown; the chin and upper part of the throat are white, the lower part of the throat and chest being orange, brownish yellow, or pure yellow. This animal is found only on the densely wooded hills, and is not often seen, although its range extends from the Himalayas, where it is generally found at an elevation of from 7,000 to 8,000 feet, to Nilgiri. This species generally travel in parties of five or six, and give utterance to a low chuckle, which becomes a harsh cry when they are excited.

FISHER.

The largest member of the Marten group is the Fisher (Mustela-pennanti), known also as the Pekan, Fisher Marten, Pennant's Marten, "Black Fox" and "Black Cat;" the two last titles having been given it because in size, color and build it resembles the fox, and cat, more than it does the Weasel. The length of the body is from twenty-four to thirty inches, and the tail is from twelve to eighteen inches long. The general color of the fur is a blackish brown becoming grey at the head and neck, but showing no light colored patch at the throat.

The range of the Fisher covers the greater part of North America from the upper part of Texas to Alaska, but continual hunting has exterminated the animal in the sections east of the Mississippi River. It is nocturnal and aboreal in habit and very agile, often leaping from tree to tree in pursuit of its prey. Its nests are found in holes in trees, high above the ground. The skins are at their best in the northern country from October to May, and the customary mode of capturing the animal is by means of set traps.

The name Fisher is evidently a misnomer, for while it will eat any fish that may come in its way it does not catch fish for itself, and makes its home in the swamps and on the wooded sides of the mountains, away from the water, feeding principally on snakes and porcupines, varying the diet occasionally by devouring one of its own cogeners.

The fur is coarser and not as valuable as that of the American Marten, but it is handsome and durable, and in fair demand for fine neck pieces and muffs. In the European markets the Fisher is generally known as the Virginia Polecat.

It brings forth its young in April or May, producing from two to four at a birth.

MINK.

The true Mink (Mustela-vison) is confined to North America, but the Mustela-lutreola, called Nerz or Sump-otter by the Germans, has rightly been classed as the European Mink, in spite of essential differences in structure. and quality. A white upper lip always characterizes the European varieties. Minks of inferior quality that are classed as local varieties of the Russian Mink, are also found in Japan, and China where they are generally called Chinese Weasels.

The Mink is distinguished from the other members of its genus by a narrower muzzle, longer premolar teeth, and a partial webbing of the toes. Like all members of the Marten group the Mink has a bushy tail, about half the length of its body which measures from fifteen to eighteen inches. The pelage consists of a soft, dense under-fur mixed with long, stiff, glossy hairs, the latter being most in evidence on the upper part of the body. The color varies from a light, yellowish brown in the poorer representatives of the species, to a rich chocolate in the finer grades. The chin is always white, and small irregular patches of white are often found on the under part of the body. The Mink ranges over the greater part of North America; the choicest specimens coming from Maine and Nova Scotia; next in value are those from Canada, New York and New England; the poorest American qualities come from the southern section of the United States, and the intermediate grades from the central, western and northwestern states.

The Mink is an amphibious solitary animal, semi-aquatic in habit, living in holes in the banks of streams and lakes. The young, four or five to a litter, are born early in the spring, and remain with the mother until the autumn. The Mink is a good diver and swimmer, and can remain under the water a long time; it has been known to pursue and catch as agile a fish as the brook trout; and as an evidence of its remarkable strength, it is said that a Mink has been seen to drag a mallard duck a mile to its hole so that its mate could join in the feast provided by so much effort. This animal has a keen sense of smell and wonderful tenacity of life, a case being recorded where a Mink was found alive twenty-four hours after it was crushed flat by a falling tree.

The fur of the Mink is used for muffs, neckwear, coats, linings, trimmings, and sleigh robes. It is one of the most fashionable furs this season and it is never entirely out of style, although at some times it is less popular with wearers of furs than at others.

The Russian Mink is a good size and dark in color, but it has a flatter appearance than that of the American Mink because the fur is shorter and the top hairs are not so long and numerous.

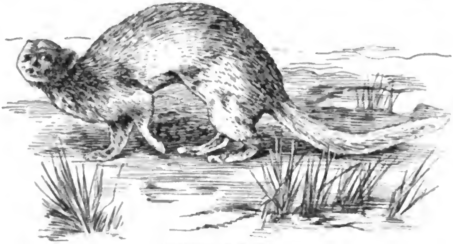
KOLINSKY.

The Kolinsky or Siberian Mink (Mustela-sibirica), also known as the Chorok, Red Sable and Tartar Sable, is the connecting link between the Marten and Polecat groups of the Weasel family. The Tartars call it the Kulon. It is about fifteen inches long, has an eight-inch tail, and the fur is of a rich brown or tawny color. This animal is found in the district east of the Yenesei River, and has for some time received favorable consideration from the furriers, by whom it is now dyed to imitate the Marten and Sable, the same as they dye Japanese and Chinese Mink to make a cheap substitute for American blended Mink.

The hairs of the tail of this animal are sometimes used in the manufacture of brushes.

THE WEASEL.

The Common Weasel (Mustela-vulgaris), is distinguished from the Polecats by its smaller size, slender body and differences in cranial development, as well as the fact that its winter coat is different in color from its summer covering. The range of this animal extends over all Europe, Northern and Central Asia, and a large part of North America. It is about eight inches long, and its tail will measure from two to two and one-half inches. The throat and under parts of the body are always white, but the outside of the limbs and the back are a dark brown in summer, often changing to white in winter. It is a bold and inquisite animal, whose food consists of small birds, mice, etc., but it will seldom attack a rabbit or a poultry-yard. It is quick of movement, has a strong power



INDIAN WEASEL.

of scent, and follows the small animals on which it preys to their hiding places. Common Weasels bring forth from four to five young, and generally live in a nest of dry leaves placed in a hole in a cave or a hollow tree.

TAYRA.

THE TAYRA.

The Tayra or Taira (Galictis-barbara), is found in Central and South America. It is the largest member of the Weasel group measuring over twenty inches, exclusive of the tail which is nearly as long as the body. It is dark brown above and yellowish on the under part of the body. Tayras often hunt in companies for the small animals upon which they prey.

THE GRISON.

The Grison (Galictis-vittata), has its habitat in Central and South America, and Mexico. It is about the size of a Marten, and is black in color except on the top of the head, back and tail, where the long hair is bluish grey. The sharp contrast between the grey crown and black face gives this animal a vicious look in keeping with its savage disposition. It lives in hollow trees, holes in the ground, and clefts in the rock. It feeds on small mammals and birds. Like the other Weasels it destroys the poultry in settled districts. The odor it emits is, if possible, more nauseating than that of the skunk.

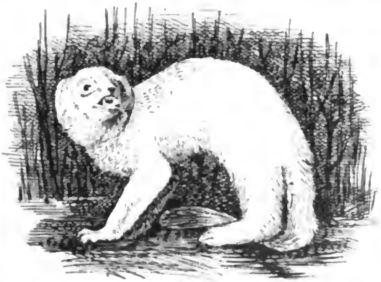
Allemand's Grison (Galictis-allemandi), a larger and less common species of this genus, has the same range as the above. The skins of these animals have no commercial value, and they are only noticed here because of their connection with the Weasel family.

ERMINE.

The most important member of the Weasel group is the Stoat or Ermine (Mustela-erminea), sometimes called the greater Weasel. The fur of common Weasels is often sold as Ermine, but the winter dress of the Stoat is the only true Ermine. The Stoat though closely allied to the common Weasel and of similar habits is its superior in size, and in the purity and depth of its fur; another distinguishing feature is the black tip on its tail which never changes color even when the rest of the fur turns white.

The habitat of the Stoat, like that of the common Weasel, is spread over a large portion of the globe; the finest representatives of the species being found in Siberia, British North America and Alaska. In the higher latitudes it invariably assumes the white winter dress which characterizes the Ermine. This change also takes place in winter in the highlands of Scotland, and the United States as far south as Pennsylvania, New York and Massachusetts. Partly white specimens have even been taken at times in Virginia but in the milder climates the fur is generally of a tawny brown color above all the year round. Various reasons have been advanced by different authorities for the change of color the Stoat undergoes at different seasons, and all seem to agree that the change is due to the necessity of the color of the animal being adapted to its external surroundings, as it is noted that the change of color seems to be determined by the presence or absence of snow in its habitat. The native of the far north have a legend that the white coat is given to the Ermine by the Creator to enable it to escape the notice, as it travels over the frozen wastes, of large and powerful enemies against whom it could not contend.

STOAT IN SUMMER DRESS.



STOAT IN WINTER PELAGE.

The haunts of the Stoat are in stony places and impenetrable thickets that afford it a refuge from the larger animals. It lives on poultry, game and smaller animals;

and it is claimed that when food is abundant it will only suck the blood and eat the brains of its victims, leaving the flesh untouched. The Stoat moves very rapidly and hunts its prey by day and by night. It is a good climber and also a good swimmer, although not an aquatic animal. The young are produced in the spring, the usual number to a litter being five to twelve. The full-grown animal is about seven to twelve inches long, exclusive of the tail which will measure about four inches.

Royal in its beauty, the fur of the Ermine has at all times adorned the state robes of kings and queens, and has always been in favor for occasions where full dress was demanded. At present it is very popular for street wear as well and the price is very high for the better grades.

The fur of the Ermine when made up with black spots instead of tails is called minever, the whitest skins come from Ischimer. Good medium grades, with extra fine full furred tails that are black half their length, are received from Tomsky and Perchorsky. The smaller skins from Jakutsky and Janiseisky are white but flat, and the Lasky skins have no black points on the tails. The Barabinsky skins are the largest and best of the Siberian Ermines. The skins are put up for sale in "timbers" of forty skins each.

THE FERRET.

Zoologists are now agreed that the Ferret (Putorius-furor), with its pink eyes and yellowish white color, is merely a variety of the Polecat, modified by the effect of long continued captivity. Ferrets came originally from Spain and Barbary, but now are bred for rabbit and rat hunting both in Europe and the United States. The Ferret has no strong local attachment and therefore must be carefully secured.

As is the case with most domesticated animals Ferrets are more prolific than their wild allies; the young are usually born in the spring, but sometimes there are two litters a year of from five to ten each. The Ferret will almost invariably seize a rabbit behind the ears.

THE SKUNK.

A well known scientist, when asked if the Skunk was a polecat, replied: "Yes—and more too." Cuvier explains the meaning of this remark when he says: "Among a family remarkable for its stench, the Skunk (Mephitis-mephitica) is distinguished by a sort of stench far exceeding that of the remaining species. The odor it produces resembles that of the Polecat, mixed with a strong smell of garlic—nothing could be more nauseous"; any one who has encountered it, will know why the French formerly called this animal "enfan-du-diable"—the child of the devil.

Like the Polecats, the Skunk has thirty-four teeth; two false molars above, and three below; but the superior tuberculous one is very large, and as long as it is broad, and the inferior carnivorous has two tubercles on its inner side; circumstances which ally it to the Badger, just as the Polecat approximates to the Grison and the Glutton. The anterior nails of the Skunk, like those of the Badger, are long and fitted for digging, and they are moreover semi-plantigrade. The American Skunk has sometimes been called the Fitchet of Pennant. Its general color is brownish black with a white tip on the head. It is marked on the back with white stripes of considerable individual variation, narrow in some and wide in other specimens, but all have the white spot on the head, and a white tip at the end of the long, bushy tail, which they carry curved over the back when walking. The slightly curved claws are set in straight toes. The head is small, and the ears are short and round, and the stoutly built body is moderately elongated. It is terrestrial and fossorial in its habits.

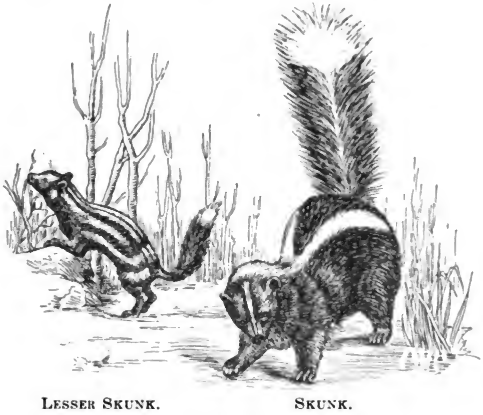
The Skunks make their homes in holes in the ground, in hollow trees, or in crannies in the rocks. They are good climbers but prefer the clearings and the open glades to the dense forests. The young are born in the spring, six to ten in number, and remain with the mother until the following spring. Dr. Merriam says, that when captured early in life, Skunks make pretty and agreeable pets, gentle in manner, and cleanly in habits. They feed on insects, birds, eggs, frogs, mice and rabbits, sometimes even leaves and berries. Several families of Skunks will live in one burrow.

It is hard to intimidate a Skunk as besides being of a fearless and unsuspicious nature, it seems to be conscious of the power it possesses of putting all enemies to rout with the nauseous artillery which it can at all times bring to bear on the object of its wrath. This secretion, with its penetrating, lasting, never-to-be-forgotten odor, is contained in a pair of glands located under the tail; and can be ejected at the will of the animal with such force that the fluid will carry from thirteen to sixteen feet, as many unfortunate victims can testify. Strange as it may seem the flesh is said to be white, tender and highly palatable. Skunks are caught in traps. The finest skins come from Ohio, and the country east of that state. Western and southern skins are coarser and not so full furred. Skunk farming is carried on successfully in different sections of the country.

Whatever we may think of the Skunk otherwise, its fur is certainly worthy of the high regard in which it is held by the public. Many wearers of "Alaska Sable" and "Black Marten" furs, have no suspicion that their beautiful muffs and neck pieces are made of Skunk skins, for when properly dressed and cured the skins soon lose the objectionable odor, which has made the useful and handsome Skunk famous—or infamous.

The natural black skins are the most valuable, and where the white stripes are not too large they are cut out by the furriers, so the balance of the skin can be used in its natural color, which is a brownish black on top, and deep grey at the roots. The white skins, and those in which the stripes are too prominent, are dyed either a jet black, or as near as possible to the natural color of the skin. Some dyers are very successful in imitating this shade, but when the natural and dyed skins are placed side by side it is easy to see that man at his best is only a poor imitator of natural products.

The Lesser Skunk (Mephitis-putorius), sometimes referred to as the Little Striped Skunk, and for some unaccountable reason called "civet" by the furriers, belongs to the same genus as the common Skunk, but it is a much smaller animal, with different cranial characteristics, and it has the peculiar odor of the Poelcat. It also differs in the white markings which it shows in an endless variety of detail on its black fur, but which are always so arranged as to form a lyre, more clearly defined on some specimens than on others. This animal never exceeds a foot in length, and its tail is shorter than the head and body. Its range is in the lower part of the United States, and as far south as Yucatan and Guatemala. In working up these skins no attempt is made to cut out the white stripes, but the furriers match them so that on the finished article they will look like the lines of one general design. The largest skins come from the northern part of its habitat, the animals growing smaller, coarser and fatter as they go south.



LESSER SKUNK. SKUNK.

Nearly allied to the above species is the long tailed Skunk (Mustela-macrura), of Mexico, whose tail is longer than the head and body combined.

There is a white backed Skunk in South America (Conepatus-mapurito), which is heavier than the others and has a more pig-like snout with nostrils directed downward instead of laterally. It has only thirty-two teeth, extremely small ears, and a shorter tail than the other species. The body is from eighteen to twenty-four inches long, and generally marked on the back with two very wide white stripes; the under part is always black, and the tail is white and black. Its range is from Patagonia and Chili, through Central America, as far north as Texas.

In Nicaraugua the Skunk goes along at night with its tail up as a danger signal. Naturalists claim that the conspicuous markings of the Skunk are "warning colors" that are a benefit to the species as well as its enemies, as many a time a man who would hesitate a long time before hunting a Skunk, would take a shot at an animal of whose identity he was not certain.

The gait of the Skunk is a measured walk, but it can shuffle along at a pretty good speed if necessary. A peculiarity of this animal is its indifference to the presence of man, which is evidenced by its being so often run over by vehicles.

POLECATS.

Polecats are the most sanguinary of all the Weasel tribe. They are larger and more powerful than the Skunks and Weasels, but as a rule are smaller in size and have shorter legs than the Martens. They were formerly known as Foulmart (Foul-Marten) because of their fetid smell, due to a secretion carried by these animals in small glands. They are the terror of poultry yards and warrens, for while they are less active than the Martens, they not only work havoc with the rabbits, poultry, birds and small rodents, but also destroy the eggs and young of their prey in their burrows and nests. The lower carnivorous tooth of the Polecat has no inner tubercle, and the superior tuberculous one is more broad than long; there are two false molars above and three below; they can also be distinguished from the Weasels and the other Martens by the absence of the first pair of molars in both jaws.

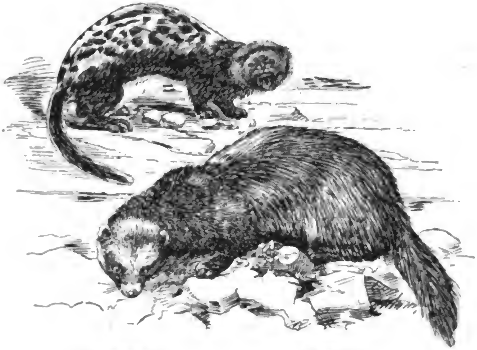
Fitchet, or Fitch Cat, is the name given to the common Polecat of Europe (Mustela-putorius). It has a fur made up of a woolly yellow under-fur showing through long, glossy dark top hairs; in the Russian skins the under fur is almost white. The body of this animal is about seventeen inches long, exclusive of the tail which measures about six inches. It is a nocturnal animal inhabiting the deserted burrows of other animals in the forest and issuing forth at night for its depredations. "Fitch" was a popular fur with our grandmothers, and at present has come back into favor. The finest darkest skins come from Germany.

The Perwitsky or Sarmatian Mottled Polecat (Putorius-sarmaticus), is a distinct species, that has its habitat in the wilds of Siberia, Russia and Central Asia—principally Afghanistan. This species is not exclusively nocturnal, but it passes the greater part of the day in some deserted rabbit burrow, or in a deep, dark crannie in the rocks or an opening between large stones, issuing forth at night to procure food. It is a fearless, ferocious fighter, and does not hesitate to attack animals many times its size. Where it cannot outspeed its victims it patiently tracks them until it can steal upon them. The Perwitsky is generally caught in traps; sometimes it is smoked out of its burrow into a net spread over the opening; and occasionally it is roped as it escapes to the trees. The fur of this species is of an orange color, with irregular brown spots on the upper part very much like the thighs of the Russian Sable in color and texture, underneath it has glossy black fur. It is a much smaller animal than the common Polecat, measuring from seven to ten inches in length. Like that of the Fitch, the fur of the Perwitsky was very much in vogue fifty years ago, but for a long time was neglected by the furriers; it is in demand again at the present time, being admirably suited to the effects which the designers are producing in this season's garments.

The Black-footed Polecat of North America (Mephitis-migripis), is found in the Central plateau of the United States as far south as Texas. It is larger than the common species, measuring about nineteen inches exclusive of the tail which is about five and one-half inches long.

It is of a brownish white color, with the feet, the tip of the tail, and a broad stripe across the forehead black. It shows the distribution of dark and light colors characteristic of all members of this family.

Other unimportant species of this animal are the Siberian Polecat (Mustela-eversmanni), which can be distinguished by certain differences in the form of the skull and its nearly white back and head; and the Tibetan Polecat (Mustela-larvata), found in Ladok and Tibet.



PERWITSKY. POLECAT.

The Cape Polecat of South Africa (Itonyx-zorilla), is so much like a small Skunk that it is often taken for a member of the same group; the teeth, however, are smaller and more like those of the Polecat between which and the Skunks it appears to be a connecting link. Both in size and shape it is like the Polecat. It has a broad head, small rounded ears, and a very sharp muzzle; the tail is bushy, and about three quarters of the length of the body which measures about twelve inches. The fur is glossy black and marked with white stripes and spots. The upper part of the tail is mostly white, and there are always some white spots on the head and tail. Its range is from the Cape of Good Hope to Senegal.

Another species of the Zorilla is the Itonyx-funata, which is found in Egypt, and ranges across the Isthmus of Suez into Asia Minor. This animal frequents the rocky districts, and is purely nocturnal; it is not able to climb like the Martens and Polecats, and only takes to the water when compelled to do so. It has an odor as intolerable as that of the Skunk, but it is found in many of the homes of the Dutch Boers in South Africa, where it is kept to destroy vermin.

The South African Weasel (Poecilogali-albinucha), with one exception the only Weasel found in Africa south of the Sahara, is almost exactly like the Cape Polecat in coloration and marking. It is placed in a distinct genus because it has two pairs of premolar teeth in each jaw, while generally there is only a single pair in the lower jaw of the Polecats.

THE BADGERS.

The Badger, which Linnaeus placed with the Bears, but which is now conceded to belong to the Weasel family, is found throughout Europe, Asia, British North America, and the central and western portion of the United States; the best species coming from the western continent. In some places it is called the Javanese Skunk, because of its offensive odor. The Badger is of a shy and retiring disposition, never courting danger, but when brought to bay will put up a fierce and stubborn fight. It is nocturnal, lives in burrows of its own construction, and in the colder regions hibernates during the winter. It is partial to bird's eggs and bee's nests with their honey and larvae, but its principal food consists of fowl and the various species of small rodents. Badgers are conspicuously distinguished by a pouch beneath the tail, from which a greasy, fetid secretion exudes.

This animal measures about two feet in length, exclusive of the six inch tail. It stands low on its legs, is clumsy in its movements, has a long snout, and long claws peculiarly adapted for digging. The American Badger (Taxidea-americana) has a light yellowish under fur, covered with long black and white hairs that grow much longer on the sides than on the back; and the skins are used principally for making robes, muffs and other furs. **The European or Common Badger** (Meles-taxus) is much coarser and darker than the American species; and the hairs of most of the skins of this variety are used for brush-making, although the great majority of skins used for that purpose come from Russia.

AMERICAN BADGER.

The brush manufacturers shave the skins on the leather side, then wash them in alkali to remove the grease, after which the hair is cut off close to the pelt and sorted into lengths; the longest hairs being used for graining brushes, and the medium length for shaving brushes, while the tooth brushes are made of the shortest hairs.

Badgers at one time were very abundant in England, and are still found in the southern part of Great Britain.

The Ratel, a small, clumsy looking creature, about the size and appearance of the Badger, is often called the **Honey Badger**. There are two distinct species of this animal; the (Mellivora-indica), found in India; and the (Mellivora-ratel), which has its habitat in Africa. A black Ratel, that ranges the Ituri forests, is known as the

(Mellivora-cottoni). Both the other species are iron grey on the upper parts, and black below, and have thickly built, stout bodies; their legs are short and strong, and armed, especially the anterior pair, with long curved claws with which they dig up the earth in search of the honey combs of the wild bees; their tails are short and their ears are reduced to mere rudiments. They have stout, heavy, conical skulls. The two species may be distinguished from one another by a distinct white line around the body of the African species, at the junction of the grey of the upper side with the black of the lower, which is wanting in the Indian Ratel; the teeth of the former species are also larger, rounder and heavier than those of the latter.

The Sand Badger (Arctonyx-collaris) is a yellowish animal, larger than the common Badger and looking very much like a small bear. It is nocturnal and omnivorous in habits and very fierce. It is found in Eastern India, from the eastern Himalayas to Burma. A small Sand Badger (Arctonyx-taxoides) is found in Assam, Arakan and also in China. It is said there is another species in Tibet, with a tail much longer in proportion to the body than any of the rest of the group.

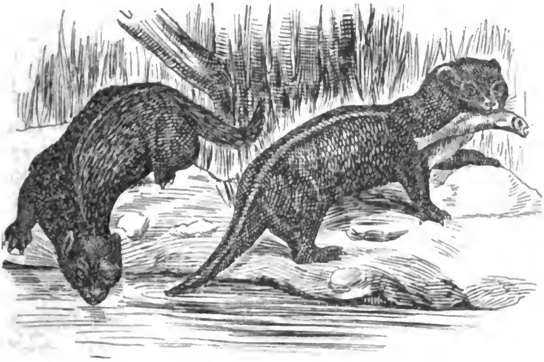
There are four species of **Ferret Bagders** (Helictes), which are found in Asia and the Eastern Archipelago; and the **Stink-dachs** of the Germans (Mydaus-meliceps), which is said to be the connecting link between the true Badgers and the Sand Badger, has its habitat in the Malayan Peninsula.

OTTER.

All Otters are so like one another that it is difficult to determine the exact number of species, but it is certain that there are at least ten species of true Otters; one of which is European and Oriental, three are exclusively Oriental, two are African and four are American. The largest member of the group is the Brazilian Otter, the smallest representatives are the feline Otter of South America, and the clawless Otter of India; the best known of the species is the European or Common Otter (Lutra-vulgaris), and the most valuable is the North American Otter (Lutra-canadensis).

Otters vary much in size, the average length being thirty inches, exclusive of the tail which will measure about fifteen inches. The general color of the fur varies from a fawn to a liver brown when the top or hair coat is on the skins, the chin, throat and under part of the body always being lighter than the back. The under-fur remaining, when the top hairs have been plucked out, varies from a light tan in some skins, to a golden brown tint in others.

Their elongated forms, with but slight restriction at the neck, enable the Otters to glide through the water with ease and speed, and the dense under fur affords them protection against the cold. Their teeth are so constructed that they can both hold such slippery prey as fishes, and pierce their scales, with equal facility. They have broad, flat heads with small external ears, a neck so thick that it passes imperceptibly into the trunk, and short legs with webbed feet, and curved blunt claws. They are expert and graceful swimmers and divers, and live exclusively on fish when they are procurable. They frequent all kinds of bodies of water, sometimes even descending to the sea. In feeding they hold the fish in the forepaws, eating down to the vent, and leaving the tail, but only a small proportion of the fish they capture are devoured, as the Otter seems to delight in killing for killing's sake. Otters never hibernate, and in winter, when they cannot procure fish, they will kill poultry, and smaller animals. They are generally found in pairs, or family parties of five or six. They are somewhat deficient in sight, but the other senses are well developed. When excited they give a yelping bark, and are said to sound a sort of whistle as an alarm note to their fellows. Otters build their homes in the hollows under roots of trees near the water's edge, or in hilly districts in the clefts between the rocks; sometimes their abodes have several entrances, one of which opens under the water. The young may be produced at any time, although winter is the usual season; they are born blind, and a litter generally contains from two to five cubs, which can easily be tamed if caught when young. The North American Otters are said to travel so fast in going across country from river to river, that it is hard for a man to overtake them; on the ice they progress by making a series of jumps, and then sliding on their bellies as far as the impetus thus acquired will carry them. They have a curious habit of sliding down smooth or steep banks of snow or mud, and are caught in steel traps, set under the water at the bottom of one of these slides, or under the snow at the top. They are animals of high general intelligence, and very successful in evading traps. When domesticated they will follow like a dog.



OTTER

The fur of the Otter is very valuable, as it can be used for nearly every purpose, either in its natural state, or plucked and dyed. The skins of the North American Otter are worth raw from fifteen to fifty dollars each, and those of the European species from five dollars to fifteen dollars. The finest skins come from Canada, Nova Scotia and Labrador; those from the York Fort district are large, thick and dark; the Halifax skins are also very dark, but rather coarse, like the Norwegian Otters. The best skins come from the East Maine district, and are almost black. Otters found in the Southern States have a thick pelt, and are of low standard. Silvery skins are occasionally met with, but they are rare; the white are more common.

There are three species of South American Otters; the largest of these, the Brazil Otter, is often called the Margin Tailed Otter because it has a distinct ridge running along each side of the tail; it is about forty inches long, and has a twenty-two inch tail; the nose of this species is covered with hair. The color is chocolate on the back, but lighter on the under parts, and it also has light spots on the chin and throat, and some dark spots on the under fur. There is a hairy nosed Otter found in the Malay Peninsula. The Japanese Otter is very fine in quality.

SEA OTTER.

Zoologists while classing the Sea Otter (Latax-lutris) as belonging to a genus apart from that containing the common Otter, consider it as a member of the family Mustelidae, and we have therefore placed it with the Weasels, although in many of its habits, in its general appearance, and in the possesson of long flipper-like hind feet, it very much resembles the Eared Seal.

The body of the Sea Otter is about three feet long, tapering to the front so that it joins the small rounded head without any marked constriction at the neck. The skin is so large and loose for the size of the body that when it is removed from the animal it can readily be stretched to one-third more than its apparent length. The pelage consists mainly of a fine, soft fur, among which are a small proportion of long stiffer hairs. The general color is a dark liver brown, silvered over with the greyish tips of the longer hairs. The Sea Otter differs from the common Otter not only in external characteristics, but in the construction and the number of its teeth—having only thirty-two teeth, while the common Otter has thirty-six, and Dr. Coues says: "If the teeth of ordinary carnivorous quadrupeds be likened to fresh chipped, sharp and angular bits of rock, those of the Sea Otter are comparable to water-worn pebbles." Sea Otters are very playful and will lie upon their backs in the water for hours tossing pieces of sea weed into the air from paw to paw, or sporting with their young. Their food consists almost entirely of clams, mussels, sea urchins and other shell fish, from which they extract the contents by taking one in each paw and striking them together to break the shells. The young may be born at any season, but only one is produced at a birth. The mother sleeps in the water on her back, with her young clasped between her fore paws. Pups have frequently been captured alive, but it is impossible to raise them as when taken from their mother they invariably die of self-imposed starvation.

Sea Otters inhabit both coasts of the North Pacific; their chief haunts on the Asiatic side being found in Kamschatka, and on the American side in Alaska, the Aleutian Islands, Sitka Island on the west coast of Canada, Vancouver Island and the shores of the continent as far south as Oregon. It is stated by Mr. H. W. Elliot that when the Russian traders first opened up the Aleutian Islands they found the natives wearing cloaks made of the fur of the Sea Otter; and that when the Pribilov Islands were discovered in the Bering Sea upwards of five thousand Sea Otters were killed the first season, but in less than six years these animals had completely disappeared from these islands; and now they are becoming so rare everywhere, that nothing but government protection can save the species from total extinction. Mr. Elliott says: "Over two-thirds of the Sea Otters now taken in Alaska are secured in two small areas of water around the Islands of Saanach and Chernobours and most of those taken on the Coast of Washington and Oregon are secured in the neighborhood of Grey's Harbor, which shows that these animals seem to have a preference for certain localities to the exclusion of all other territory."

Because of their quick hearing and acute smell Sea Otters are hard to capture by shooting or clubbing, unless there is a heavy gale from the north to drown the sounds made by the approaching hunters. Some of the natives spread nets over the kelp-beds where the Otters are in the habit of sleeping, when the animals becoming paralyzed with fear as they find themselves entangled in the meshes, fall an easy prey to the hunters.

The Sea Otter furnishes one of the most valuable of furs as a single skin will often sell for from one thousand five hundred dollars to two thousand dollars, and the average price of a season's catch is about five hundred dollars per skin.

SEA OTTER.

THE WOLVERINE.

The Wolverine (Gulo-luscus), is known all over Europe as the Vielfrass. By the French Canadians it is called Carcajou; and by the British residents of North America it is named Quick-hatch.

Linnaeus placed the Wolverines among the Bears, whom they really only resemble in their plantigrade movements; approximating much nearer to the Weasels, in their teeth, as well as in their habits. Scientists are now agreed that the Wolverine should be placed with the Weasel, in spite of the fact that it belongs to another genus and is different in appearance and dimensions from all the other members of the Weasel family. It has the same number of teeth as the Weasel, but they are unusually powerful and strong, distinctly resembling those of the Hyaenas.

The Wolverine is an inhabitant of the northern regions of both hemispheres. It is heavily and clumsily built; has thick, stout limbs; and like the Badger walks with the back arched, and both head and tail carried low. The head is broad and rounded, with small, widely separated eyes, and small rounded ears. The length of the body is from twenty-four to thirty-six inches, and the tail, which has a plait or fold in place of a sac, measures from twelve to fifteen inches. The body is covered with a thick, woolly under fur, and a top coat of long, coarse hair. The general color is blackish brown, with distinct bands of chestnut brown or some lighter tint, commencing behind the shoulders and running down the flanks to meet at the root of the tail, forming a perfect disc on the back. The fur on the front and sides of the head is of a light, grey color. In the Western Hemisphere this animal ranges as far north as the Arctic coast, and as far south as Lake Erie on the eastern side of the continent, and Salt Lake on the western side; in the mountains it is seen as far south as Arizona and New Mexico. It is a forest haunting species, nocturnal in habit and can travel rapidly. It is so voracious that it has been termed the Glutton. It hunts during the night; does not become torpid during the winter; and is a solitary animal, living in subterranean holes, where its young are born in June or July. It is sanguinary and ferocious and masters the largest animals by leaping upon them from trees, and in pursuit of its prey it has been known to swim rivers.

The Wolverine is a natural born thief, often stealing things for which it has no possible use. In search of food it will rob the traps set for other animals, and it will devour any beast or bird it can catch. It is wonderfully sagacious, and is very difficult to trap because of its ability to detect the preparations made for its capture. Lydecker says: "When one of them has discovered a line of Marten traps the trapper may as well relinquish his trade until he has destroyed the marauder. Every trap along the line will be pulled to pieces and the bait or captured marten removed, and after the hunger of the Glutton is satisfied the remainder of the booty will be buried. Another curious propensity of the Glutton is its habit of stealing and hiding articles which can be of no posible use to it; and an instance is recorded where these animals removed and concealed the whole paraphernalia of a hunter's lodge, including such articles as guns, axes, knives, cooking vessels and blankets." Strange as it may seem, in spite of its cunning, this animal is itself caught in large traps made to look like caches, into which it will break to get the bait which is concealed instead of being exposed in the usual way.

The darkest specimens of this animal are found in the glacial regions of the Eastern Hemisphere. The Common Glutton or Rossomak (Urus-gulo) of Russia has a fine, deep maronne color, with a darker disc.

The fur of the Wolverine is seldom used for anything except sleigh robes and rugs, and the manufacture of tails that make a good imitation of the stone marten tails.

Hot climates produce some species, which only differ from the Gluttons in having one false molar less in each jaw, and a long tail. Such are the animals called Ferrets by the inhabitants of South America, which while they have the teeth of our Ferrets and Polecats and similar habits, are distinguished from them by their plantigrade movement.

RACCOONS.

The Raccoons or Ratons (Procyonidae), are a very small family of Carnivores whose habitat is principally confined to the central and southern portions of the North American continent. The skull has the same essential characteristics as that of the bear, and while in some other respects their external appearance is like that of a bear in miniature, they differ in other ways very materially from that animal, having well developed tails marked by alternate dark and light rings. They have the same plantigrade feet, but they rest the whole sole of the foot on the ground only when they stand still; when they walk they raise the heel. The dark brown fur on the body of the Raccoons is thick and rather coarse and has tips of greyish hair; the muzzle is white, and they have a brown streak across the eyes. The length of the body is from twenty-two to twenty-six inches long. A Raccoon will weigh from fifteen to thirty-five pounds when in the best of condition. Raccoons have three back tuberculous molars, the superior of which are nearly square; and three pointed false molars in front forming a continuous series to the canine, which are straight and compressed. The total number of teeth in these animals is forty.

RACCOON.

Raccoons (Procyon-lotor) are extremely common about the borders of the Adirondacks. They are good climbers, and they delight to sport on the margins of pools and streams, where they capture fish lurking beneath the stones and the fresh water mussels buried in the mud and sand, but although they are good swimmers they are unable to dive in pursuit of their prey. Trees are their refuge when pursued by foes, and form their resting, and breeding places. Their nests are made in hollows high up from the ground; but as it does not hunt its prey among the tree tops the Raccoon cannot be considered as an arboreal animal, nor does it gather nuts or fruit from the branches, or feed upon young shoots or twigs, preferring a diet of eggs, birds, fish and smaller animals like mice. From a singular habit it has of eating nothing without first dipping it in water, the Germans call it the Wash Bear.

Raccoons are the most strictly nocturnal of all North American mammals. They commonly live and travel in small companies and do not return to the same nest every morning, but often make excursions in various directions that last several days, taking refuge at the approach of dawn in any convenient arboreal shelter. In the Adirondacks the young, numbering from four to six to a litter, are produced early in the spring, and remain with the parents about a year. Raccoons hibernate during the severest part of the winter, retiring to their nests high up in the trees early in the fall, and not appearing again until February or March of the following year.

Raccoons are easily caught in steel traps, if these are set under the water at the edge of swamps or streams; but the sporting method of hunting them is at night with trained dogs, when after a short run they invariably take to a tree where they are shot by the hunter.

Because of the many purposes for which it can be used the fur of the Raccoon ,though not expensive, is very valuable. Either in its natural state, or dyed, it is manufactured into sleigh robes and coats; as well as such small furs as muffs, neck pieces, caps and gloves.

The Coatis have a singularly elongated and flexible snout, and the teeth, tail, nocturnal habits, and slow dragging gait of the Raccoon. Notwithstanding their long nails, which are used for digging, and their semi-palmate feet, they climb trees. They inhabit the warm climates of America, and their diet is nearly the same as that of the Marten in Europe.

The Cacomistle or **Bassarisk** is a small member of the Raccoon family, inhabiting Mexico and parts of the United States. Its body is sixteen inches long, and its tail will measure about fifteen inches. It is rather slender, has a sharp, fox-like face, and large bright eyes surrounded by light patches which, with the erect ears, give an alert and pleasing expression to the countenance. Its fur is long, soft and light brown above, darkest along the back, and the long bushy tail has six or eight broad, white rings; the fur on the under parts of the body is white.

This animal has been called the Cacomistle by the Mexicans, and the Bush Cat, Raccoon Fox and Ring Tail by skin dealers in different parts of the world, but the scientists have now agreed upon the name **Bassarisk** for the various species of the Basaris-astuta.

Plucked and dyed the fur of the Bassarisk resembles that of the Marten, and has become very popular as a substitute for it under various names, the French furriers calling it Bassarius, and others listing it as the Ringtail and Bush Cat.

The Panda (Aelurus-fulgens), or Red Cat-bear, which seems to be the connecting link between the Raccoons and Bears, approximates to the Raccoon by its canines and what is known of its other teeth, with the exception that it has only one false molar, making the total number of its teeth thirty-eight. This animal is rather larger than a cat, has a sharp muzzle and small round ears, the inner surface of which are white; a moderately long tail covered with long hair; and plantigrade feet, with semi-retractile claws in the five white toes. The face is white, with the exception of a vertical stripe of red from just above the eye to the angle of the mouth and a red stripe running down the center of the nose; there are several pale rings on the tail, the tip of which is black. Its back fur is of a remarkable rich, reddish brown color, darker below than on the upper parts. Its thick, fine, woolly under fur is concealed by long, soft, glistening and richly colored hairs, making it, according to some authorities, the most beautiful animal in the world. It dwells chiefly among the rocks on the high mountain slopes, 7,000 to 12,000 feet above sea level, but it also climbs trees, and preys on birds, small animals and insects. It also eats fruits, roots and other parts of plants, and will feast on milk and butter. It is a harmless, defenseless animal, equipped for climbing, rather than fighting. It makes its nest in hollow trees, and brings forth its young, generally two in number, in the spring. They are helpless for a long time, one litter remaining with the parents until the next comes. The Panda is easily tamed.

The Kinkajou (Viverra-caudivolvula), an animal with thirty-six teeth, a short muzzle, slender tongue, and a prehensile tail, found at elevations of from 4,000 to 5,000 feet, from Central Mexico to the Amazon River in Brazil; and the **Potto** found in parts of Africa, are also related to the Raccoons.

PINNIPEDS.

The Seals and Walruses are the only Pinniped or fin-footed Carnivores. Their entire organization is adapted for an aquatic life. Both the fore and hind limbs are modified into paddle or flipper-like organs; the upper parts of which are enclosed with the same integument as the body, while the elongated feet or flippers are covered with a skin resembling india rubber. The feet have great power of expansion and the five toes are completely connected with web. The first and fifth toes on the hind feet are stouter and longer than the three middle toes; and the skin covering on all the feet terminates in large lobes projecting beyond the extremity of the bones, and is thick and ribbed on the exposed parts, to prevent it from being injured by abrasions, when brought into violent contact with the rocks or ice. These animals all have very short tails, and are further characterized by the absence of rudimentary collar bones and the presence of large protruding eyes by which they are enabled to secure accuracy of vision under the water.

Seals are the only pinnipeds that come within the scope of this work, as the Walruses can hardly be considered as fur-bearing animals. Seals have either thirty-four or thirty-six teeth, but none of them show the flesh tooth, always found in the jaw of the fissiped or true Carnivores. The number of incisors is invariably reduced below the typical pairs in each jaw, some Seals having only two pairs in each jaw, and none having more than three pairs in the upper, and two pairs in the lower jaw. They all have five cheek teeth in each jaw, the first four of which belong to the pre-molar system. A marked peculiarity of the teeth, is a groove in the upper incisors, into which the sharp lower incisors fit so as to form a vice from which it is impossible for a fish to escape. The milk teeth are of no real use to these animals, and are frequently shed by them before birth.

At the present time, the aggregate number of Fur Seals killed in a year, in all parts of the world, is less than 30,000; and the yearly catch of Hair Seals is something less than 250,000. The following estimates of the number of Seals, of all kinds, taken in 1886, will give an idea of the location of the different sealing grounds and the relative commercial importance of the different species thirty-five years ago.

HAIR SEALS.

Newfoundland, including Labrador and the Gulf of St. Lawrence	400,000
Canadian Net Fishery, Gulf of St. Lawrence	75,000
Jan-Mayen and adjacent seas	110,000
Western Greenland	50,000
Nova Zembla, White Sea and Arctic Ocean	75,000
Caspian Sea	140,000
North and South Pacific Oceans	5,000
	875,000

FUR SEALS.

Pribilov Islands (Alaska)	100,000
Commander Island (Copper Island)	30,000
Straits of Juan de Fuca, and vicinity	15,000
Patagonia, including South Shetland Islands, and Straits of Magellan	15,000
Lobos Islands, mouth of Rio de la Plata	12,000
Falkland Islands	5,000
Cape of Good Hope, including southwest coast of Africa, and islands in South Indian Ocean	10,000
Islands belonging to Japan	2,500
	185,000

All Seals are maritime and extra-tropical with the exception of a few unimportant species found in the Mediterranean and other inland seas, and in West Indian waters. Seals are divided into two distinct families—the Phocidae or True Seals, and the Otariidae or Eared Seals—differing from one another in character and habits, as well as in external appearance. Those species having a dense coat of soft, short fur under the stiff long hair which forms the outer covering of all the members of both families, are called Fur Seals; and those which are entirely devoid of this under fur, or possess it only in a limited degree, are known as Hair Seals. Not all the Otariidae are Fur Seals; but all the Phocidae are Hair Seals, although the cubs of some of the species of the latter family are called Wool Seals, until they lose the soft woolly white coat with which they are born. The time of shedding this coat varies in different species. The cubs of the Common Seal take to the water and change their coat within a few hours of their birth, while the young Greenland Seals do not go into the water or shed their fur, until they are from four to six weeks old. Seals seldom produce more than one cub in a year, and never more than a pair. They subsist entirely upon fish, crustaceans and mollusks, and can sleep as well floating on their backs on the sea, as upon the ice floes or the land.

TRUE SEALS (Phocidae)

True Seals occur along the shores of the temperate and colder portions of the globe, but the greater number are found on the Northern Hemisphere. The members of this family have no trace of external ears, and the front limbs are always smaller than the hinder. The under surfaces of both front and hind feet are well covered with hair, and in most cases all the digits are furnished with well-developd claws. The hind feet are incapable of the great power of expansion, and want the long flaps of skin at the extremities characterizing those of the Eared Seals. There is but little difference in size between the males and females of this family, and none of the various species are Fur Seals. True Seals are with few exceptions gregarious, gentle and submissive, offering no resistance when attacked by man. They have strongly developed social instincts, and display an extraordinary affection for their young, who generally remain on the land for the first few weeks of their existence, and who, strange as it may seem, take reluctantly to the water, and have to be taught the art of swimming by their parents; but the cubs of the Common Seal are a marked exception to this rule. True Seals are more specialized for an aquatic life than the

Eared Seals. They can remain under the water twenty minutes, or more, without coming up to the surface to breathe.

Owing to their hind limbs being turned permanently back, so as conjointly to form a sort of rudder, True Seals move very slowly when out of water. They progress with a kind of wriggling motion, made by pressing the palmer surface of the forepaws on the ground either alternately or simultaneously, and sliding the body forward in a succession of short jerks.

Two of the species, the Greenland Seal and the Hooded Seal, are migratory. In May, attended by their young, they commence their northerly movements to the Greenland seas, where they spend two or three months. In September they begin a southerly migration to escape the intense cold of the northern winter; one division passing through the straits of Belle Isle to the Gulf of St. Lawrence, and the other along the east coast of Newfoundland. By the close of the year they reach the Great Banks, which is their southern headquarters. Early in February they again start northward to meet the ice fields upon which their young are brought forth in March.

The appearance of the herds as they pass a given point on their journey from the north is most imposing. Mr. J. C. Stevenson says: "The southern migration commences soon after the frost sets in. A fisherman posted as a sentinel on some headland commanding an extensive sea view, will first notice small detachments, of from half a dozen to a score of Seals each, passing at rather long intervals; the detachments gradually increase in frequency and numbers, until they are seen in companies of a hundred or more, closely following one another. After two or three days the main body, consisting of an uncountable crowd, will come into sight, and then for the greater part of two days the sea as far as the eye can reach will seem to be literally paved with the heads of the Seals.

True Seals seldom stay on the land for long periods, and even when basking in the sunshine on the beaches and ice floes, they generally keep so near the water's edge that it is difficult for the hunters to cut off their retreat.

With the exception of the Elephant Seal, none of the species of this family resort to any particular breeding ground, but produce their young on the ice floes and beaches. There are sixteen or seventeen varieties of True Seals, but only such as are of special interest, structurally or commercially, are considered in this work.

The Elephant Seal, whose habitat is in the seas of the antipodes, is the largest of all pinnipeds, measuring from fifteen to twenty feet in length. Like the next largest representative of the Phocidae—the **Sea Leopard** of the Antarctic Ocean—this species is well nigh extinct, and the few skins now taken are used for leather purposes only. Unlike most True Seals the Elephant Seal is polygamous.

The Grey Seal, or square flipper, by some authorities also claimed to be polygamous, is one of the largest True Seals of the Northern Hemisphere, sometimes attaining a length of twelve feet, although the average "Grey Back," which will weigh about 400 pounds, is eight feet long. The cubs or White-coats of this species are larger than the adult Ringed Seals, measuring from four to five feet, which is nearly the size of the full-grown Greenland and Common Seals. The Grey Seal is found in comparatively narrow limits in the North Atlantic, being commoner on the shores of Europe than on the American side, where it ranges from Sable Island to the Straits of Labrador and Disco Island, and is sometimes seen in the Gulf of St. Lawrence and Hudson's Bay. It also occurs in Iceland, and is one of the two species occasionally met with off the British Islands; but its chief habitat is the northern coast of Norway, where it usually breeds at the end of September, producing its young on the ice. The Grey Seal is the sole representative of its genus, and can be distinguished from all other species of True Seals by the form of its skull, and the simple character of its teeth. It is less docile and intelligent than the Common Seal, and cannot be tamed in the same manner.

Grey Seals have chosen localities where they come ashore, generally selecting places on the leeside of an island. Before landing they will swim back and forth several times, with head erect and eye, ear and nose on the alert, to detect the slightest sign of danger. Then carefully choosing a place where a shelf of rock, raised but little above the sea, descends vertically several feet beneath, so it will be possible for them to plunge head first into the water, and disappear upon the first alarming sound, they will emerge. Upon gaining the surface of the rock, they at once turn completely around, so they can lie with the head seaward, ready to dive on the instant, should occasion require.

The coat of the Grey Seal is yellowish in color, becoming lighter on the under parts, and is marked with dusky, ill-defined spots. The skins are seldom met with in commerce, and the few that are marketed are bought exclusively by tanners.

The Ringed Seal, or floe-rat, is the smallest representative of the Phocidae, averaging about three feet in length. It is sometimes called the Fetid Seal, because of the odor it exudes. While they are found to some extent in the North Atlantic and the North Pacific Oceans, the true home of the Ringed Seals is in the icy Arctic Seas, where their favorite resorts are sheltered bays and fjords, in which they will remain as long as they are filled with solid ice, but when the ice breaks up, they drift out to sea upon the floes, and there the young are born in April and May.

This species is not migratory, but very abundant, and of special local value to the Eskimos, who take large quantities of them through holes which they cut in the ice. The skins that are exported are used exclusively for leather.

The Ringed Seal can be distinguished from all others, by the peculiar markings to which it owes its name, its smaller body, slenderer form, longer limbs and tail, narrower head and more pointed nose. It is one of the species of True Seals that make circular blow holes in the ice, through which they ascend and descend at pleasure. The covering of the body is a dense, coarse hair, almost like wool, and the color of the adult, is blackish grey above, with oval rings, and whitish on the under parts.

The Baikal Seal, and the **Caspian Seal**, which are respectively confined to the seas which bear their names, although they are much larger, are closely allied to the

Ringed Seal. They are of special interest only because of the nature of their habitat; the Baikal Seal inhabiting a fresh water lake, and the Caspian Seal living in a sea but slightly salt.

The Common Seal belongs to the same genus as the preceding species, and the Greenland Seal. While its teeth are smaller and sharper than those of the Grey Seal they are more massive than those of the other representatives of its own genus, from whom it is further distinguished by its stouter build, longer head, broader nose and shorter limbs. In color the adult Common Seal is yellowish grey, with irregular dark brown or blackish spots; but the cubs, which are brought forth in May or June, are born with a woolly, yellowish white coat, which they shed immediately after birth. The full-grown males vary from five to six feet in length.

These Seals do not make seasonable migrations, but are found in the same haunts throughout the year. They are gregarious, but do not gather together in such large numbers as some of the other species, and prefer sheltered sounds and bays, with shallow water and an abundant supply of fish to more exposed positions. Common Seals leave the water at every tide, to rest on the rocks or beach almost invariably selecting portions that are separated from the mainland. They are more intelligent than their cogeners, and can be readily tamed; instances being recorded where they have followed their owners about like dogs, and also where they have been taught to perform tricks. Like other True Seals these animals are readily attracted by music, and will follow a vessel, from which such sounds proceed, for a considerable distance.

The Common Seal has a wide range; occurring principally, however, in the North Atlantic and North Pacific Oceans, extending on the shores of both oceans to the Arctic regions. In the Atlantic it is sometimes found as far south as the Mediterranean on the European side, and New Jersey on the American side. In the Pacific its southern limit seems to be marked by Kamschatka on the eastern, and Southern California on the western side. This species does not confine itself to the coast, but often ascends the tidal rivers to a considerable distance from the mouth, and has been known to pass up the St. Lawrence River into the Great Lakes. Apart from the Grey Seal, this is the only species ordinarily met with on the coasts of the British Islands.

The skins used in commerce come principally from northern waters, and are manufactured into leather, or used with the hair on for making saddle housings, trunk covers, tobacco pouches, toy knapsacks and a variety of similar articles.

The Greenland Seal, which is essentially a northern species, is the most important member commercially of the True Seal family. It is about the same size as the Common Seal, and at some periods of its existence similarly marked; but when full grown it can easily be distinguished by the characteristic coloration of the back, because of which it is often called the Harp or Saddle-Back Seal. The general color of the adult Greenland Seal is a yellowish white with black markings on the back, fore part of the head and limbs—the markings being less distinct on the females than on the males. In neither sex, however, is the full coloration obtained before the fifth year, and so different is the appearance of the animal at various stages of its growth that it is called by different names at different ages. For the first few months it is classed as a "White-coat"; when the woolly hair begins to fall off, and dark spots to appear in the new coat, it is designated a "Small Spot." At two years old it is known as a "Middling Spot" or "Bedlamite"; and later it is called a "Spot," until such time as it develops by reason of full coloration into a "Harp."

The migratory habits of the Greenland Seal have already been referred to; and a study of its itinerary shows, that while it is found to a limited extent in the far north, and is at rare intervals a visitor to the British islands, and parts of the West Coast of Northern Europe, its habitat is on the west side of the North Atlantic from Newfoundland to the Arctic regions.

During their migrations these animals keep close to the coast, and frequently enter the bays and estuaries, but when settled at their breeding resorts, they prefer exposed ice floes in the open sea. They are very gregarious, always assembling in immense herds. Some idea of their abundance a few decades ago is given in the estimates printed on another page of the catch in 1886; in that year a single steamer secured 22,000 skins, valued at $2.50 each, in nine days.

At the present time, the total number of Greenland Seals taken annually in the Jan-Mayen seas, is probably 30,000, and the yearly catch in the Newfoundland district is about three times that number. Unlike the Ringed Seals, and the Bearded Seals, the Greenland Seals do not make breathing or blow holes in the ice. This is probably the reason why they frequent the floes in preference to the stretches of unbroken ice. Off the coast of Newfoundland the young are born early in March, and in the Jan-Mayen district a few weeks later.

The skins of "Harps" are manufactured into leather of the finest quality, and lower grades of leather are produced from the "Spots." The White-coat skins are dyed black or brown, and under the name of "Wool-seals" are sold to furriers by whom they are worked up into muffs, collars, capes and other articles of fur wear. The bulk of the skins are sent to London for sale.

The Crested or Hooded Seal, also known as the bladder-nose seal, because the males have an appendage on the nose which they are able to distend at pleasure, is the boldest and fiercest of all True Seals. It is about the same size as the Grey Seal; the full-grown males measuring from seven and a half to eight feet in length. This species can easily be distinguished from all others by the peculiar casque-like prominence crowning the forepart of the head. It has the same migratory habits as the Greenland Seal, whose habitat it shares; and, like the latter prefers the ice floes in the open sea to the neighborhood of the land; but "Hoods" and "Harps" are never found on the same floe.

The young of the Crested Seal are born on the ice in March; and the parents will often lose their lives in defense of their offspring, rather than seek safety in flight.

The ground color of the coat, after the second year, is a blackish blue, becoming lighter on the flanks and the nether parts. The head and limbs are uniformly black, and the body is marked with whitish spots. The skins are known to commerce as "Bluebacks." They are chiefly used for shoe trimmings, muffs, gloves, military caps and clothing, but they are not nearly so abundant as the Greenland Seal skins.

The Bearded Seal, probably the largest of all northern True Seals, is circumpolar in distribution; never being found south of Labrador on the American, or of the North Sea on the European side of the Atlantic. It is boreal and solitary in its habits, nowhere abundant, and produces its young in the fall of the year. It can be distinguished from other species of the family, by the beard from which it derives its name, its superior size, its broad muzzle and convex forehead, as well as its small weak teeth. It differs from all other Seals in that the third or middle digit of the front flipper is longer than the rest, while in the other species the digits of the front flippers decrease in length from the first, or first and second, to the last.

Like the floe-rat, the Bearded Seal makes blow holes in the ice; and a ditsinguishing peculiarity is its habit of turning a complete somersault when about to dive. Its color is a shade of grey, showing individual variations in tint but always darker on the back than elsewhere. This Seal is of no commercial importance.

The Monk Seal, found in the Mediterranean and Black Seas, and the **West Indian Seal** are the only two species of the Phocidae that inhabit the warmer seas. They are neither of commercial value, nor of special interest otherwise. The full-grown males, of either species, will measure from seven to eight feet in length.

HAIR SEAL FISHERIES.

The pursuit of the Elephant Seal in the southern seas and the Pacific Ocean, was a profitable occupation in the first half of the present century. Owing to the decimation of the southern species the sealers have changed their field of operations, and now the Greenland Seal is the species mainly hunted, and the principal sealing grounds are off Newfoundland and Labrador, and in the seas adjacent to Jan-Mayen Island; although quite a number of Hair Seals, of other species, are taken in the Arctic Ocean, and in the White and Caspian Seas.

It is interesting to trace the evolution of the sealing industry in the Newfoundland district, from the day when the Seals were taken in nets set from the shore or beneath the ice, through various stages of development when expeditions were sent out, first in large boats, and later in small schooners, to harpoon, shoot or club the Seals upon the ice or in the sea, to the present time when large steamers carry crews of from 150 to 300 men to the immense ice fields, far out in the sea, where the great herds resort for the purpose of producing their young.

The cubs, which weigh about five pounds at the time of their birth, grow so rapidly, that at the end of four weeks the skins, with the three or four inches of fat which have accumulated beneath, weigh from forty to fifty pounds each. It is at this time, when the oil that is yielded is of the best quality, and their capture is easy because they have not yet taken to the water, that the young Seals are killed. When the steamer reaches the floe upon which the Seals are congregated the hunters take to the ice, armed with poles or gaffs that have a hook at one end, and are shod with iron at the other. A blow on the nose quickly despatches the animals, and then the skins with the fat adhering to them are rapidly detached with scalping knives. The skins secured are rolled into bundles, and taken aboard ship. When the ship reaches port the skins are separated from the fat, and salted for export to Great Britain and other parts, where they are sold as "Wool-seals" to furriers. The fat is ground by machinery into minute particles and steamed, and the oil resulting from the process, after being exposed to the rays of the sun for a time in glass-covered tanks, is barreled for exportation. The vessels then make a second trip for the capture of the older animals, whose skins are principally used for leather purposes. These are taken either by shooting them in the water, or by clubbing when they can be caught congregating on the ice. By a convention between the powers interested a close time has been established, and sailing vessels are not allowed to clear for the fisheries before March 1st, and steamers before March 10th.

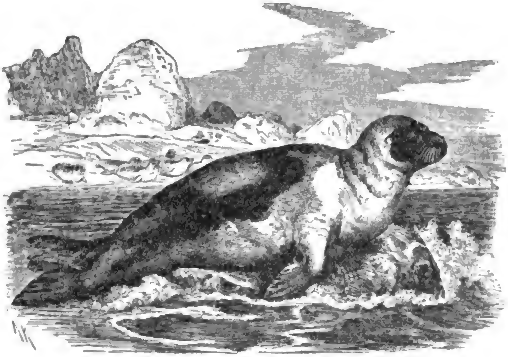
For years seal hunters from all nations conducted operations in the Jan-Mayen district, in a reckless and barbarous way; shooting the mothers as they were suckling the young, and leaving thousands of their offspring to die of starvation upon the ice; but since the establishment in 1876, by an international treaty between England and Norway, of a close time in these waters, the industry is carried on the same there as in the Newfoundland district, where the hunters wait until the cubs are ready to leave the mothers before killing the older animals.

The Russians take some Seals in the White Sea, but their most valuable sealing grounds are in the Caspian Sea, where the animals pass the summer in deep water, but in the autumn resort to the east basin, where their young are born in December and January. Some of the Caspian Seals are taken in nets, others are shot, but the greater number are clubbed to death on the ice. The Nova Zembla Fisheries, though once productive, have declined in value until they are of no importance.

Some of the Eskimo still practice what is probably the oldest method of capturing Hair Seals, harpooning from kayaks, or canoes made of skins. When within about twenty-five feet of the Seal the hunter hurls his harpoon from a wooden thrower. A bladder, attached to the harpoon by a cord, enables him to follow the course of the Seal under the surface, and to wound it again and again with his lance as it comes up to breathe, before it is finally despatched.

In some parts of Scandinavia the seal box is still used by the natives. This is a contrivance with a swining plank by means of which the Seal as it attempts to land is hurled headlong into a deep pit.

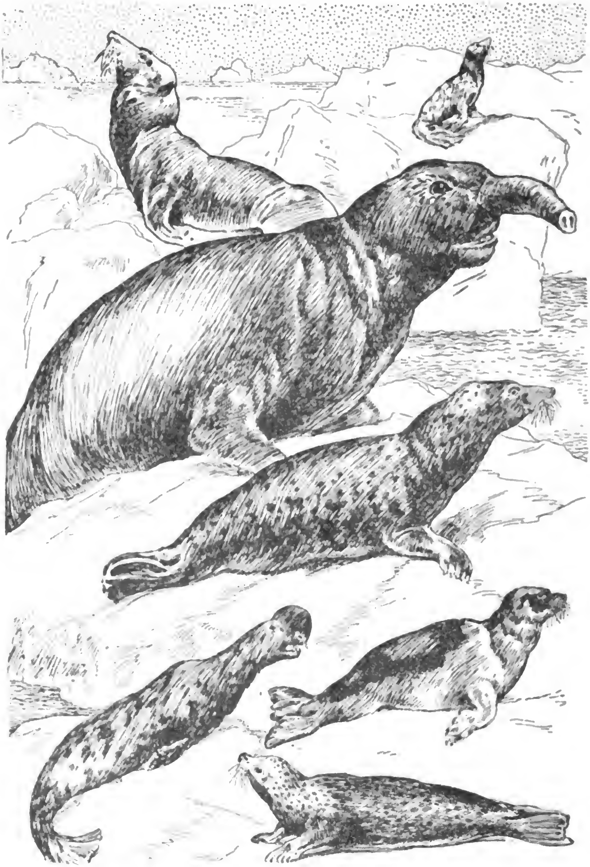
Where nets are used, in Newfoundland or Labrador, two are usually set together in the neighborhood of rocks to which the Seals resort, and they are always placed to the leeward of the mainland or some headland. When nets are used in the Caspian Sea they are hung from boats at some distance from the land; and on Lake Baikal, they are let down through the breathing holes of the Seals in the ice. When they strike the nets the Seals thrust their heads through some of the meshes, and in their efforts to extricate themselves become completely involved.



GREENLAND SEAL.

Besides the skins, a valuable product of the hair seal industry is the oil extracted from the blubber of the young animals and used for lighting and lubricating purposes. The natives of the far north look to the seals, not only for lamp oil, and the greater part of their food, but for material from which to make their boats, sledges, clothing and hunting implements.

GREY SEAL. ELEPHANT SEAL. RINGTAIL SEAL.



SEA LEOPARD.
CRESTED SEAL. GREENLAND SEAL.
COMMON SEAL.

EARED SEALS (Otariidae)

Eared Seals are active, aggressive and polygamous. They are not so highly specialized as the True Seals, having well-marked necks, well-defined external ears and hind flippers that can be turned forward under the trunk. Their fore feet are nearly as long as the hind ones, and the soles of both fore and hind feet are entirely devoid of hair. The toes of the fore feet, decrease in length from the first to the fifth, and have merely rudimentary claws; on the hind feet the three middle toes have better developed claws, but the first and last are quite clawless. These animals can progress fairly well on the land by arching the back, and carrying the body forward with a sort of jerk, or bear-like lope. The males of the family are all very much larger than the females of their species.

At one time all Eared Seals were grouped under one generic title; but now the thirteen species considered in this work are assigned to five different genera, and divided into two sub-families; the Eared Hair Seals, or Sea Lions, being grouped together in the sub-family, Tricophocinae; and the Eared Fur Seals, or Sea Bears, being grouped together in the sub-family Ulophocinae. The Sea Lions are always considerably larger, and much more powerful, than the Sea Bears found in the same locality. While these animals frequent the same shores, and often breed on the same islands, they never live together; as the Sea Lions, who are very shy and wary, and much slower and clumsier in their movements, seldom travel as far inland as the Sea Bears; and when they do meet by chance on the narrow belts of land to which the Sea Lions resort for their stations, the Sea Bears always yield their places without a struggle to their formidable opponents.

The Eared Seals spend a large portion of their time on the land, assembling in great numbers at regular seasons, at certain breeding grounds. The males are the first to arrive at these rookeries and having selected individual stations, about ten feet square in size, they keep up a continual struggle to maintain their positions, and to preserve the females they secure. As the males who have succeeded in securing stations have from six to fifteen females and in some cases even a larger number each, to protect from those who, having failed in the struggle for partners, are waiting close at hand in the rear of the colony to take advantage of any unguarded moment to raid the harems of their successful rivals, the preservation of the stations requires constant vigilance on the part of the males in possession of them. They are compelled to remain continually on the ground during the entire breeding season, undergoing an unbroken fast of about three months' duration, and becoming in consequence weak and emaciated to the last degree and losing half their weight before they return to the water. Some of the males show wonderful strength and courage in the defense of their homes and families. The fighting is mostly done with the mouth; the opponents seizing each other with their teeth, and clenching the jaws, so the sharp incisors tear deep gutters in the skin and blubber, and shred the flippers into ribbons.

The females are as gentle as the males are truculent. They remain for a time after their arrival continuously at the stations of their lords, but as they go to the sea at frequent intervals for food, they do not spend such a long, unbroken period on the shore.

The Sea Lions are less systematic and exacting in the formation and protection of their families than the Sea Bears; allowing their consorts to move more freely from place to place, and to go to the shore accompanied by their young to disport themselves in the surf.

On the Pribilov Islands, the Sea Lions come ashore, and produce their young, a month earlier than the Sea Bears.

With the exception of the California species, the general color of all Sea Lions is a reddish brown showing darkest at birth, and becoming gradually lighter with age.

Sea Bears are black, or nearly so, when born; but they become lighter as they grow older, through an abundant mixture of greyish hairs—varying, in the different species, from a whitish to a yellowish grey. The adults, of the southern species, are generally much greyer than the northern representatives of the family, and there is also considerable individual variation of color, in all the species, due to age, sex and season.

EARED HAIR SEALS

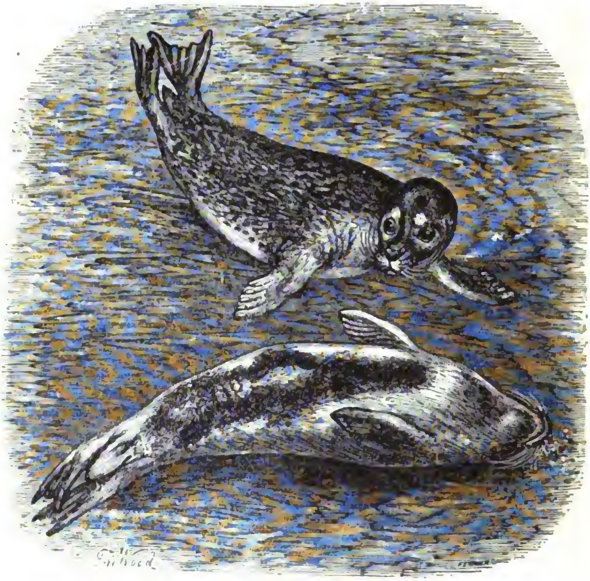
The Patagonia Sea Lion was met with by Magellan as early as 1579, and was the first species to be exhibited alive in England, a specimen having been bought by the London Zoological Society in 1866. It is found as far north as the Coast of Chili on the Pacific side, and the Rio de la Plata on the Atlantic side of South America; and as far south as the Falkland Islands and Terra del Fuego. It is docile and clever, but very suspicious, seldom leaving the shore line. It always selects isthmuses and headlands where it can have an unobstructed outlook, for its resting place when it does wander away from the water's edge. The representatives of this species are solitary in their habits, for even where a number of families, of from six to fifteen each, are seen in the same creek, it will be noticed that the individuals of different families do not associate with one another. Their daily occupation seems to be divided between sleeping and procuring food; at high tide they take to fishing near the entrances of the fresh water rivulets into the sea, the rest of the time they lie huddled together. The full-grown males of the species measure about seven feet in length, and are of a rich brown color. The young are of a deep chestnut, and the adult males of a brownish grey shade. The ears of this animal are smaller than those of any other Sea Lion, and it is also characterized by the presence of a distinct mane. The profile of its head is nearly straight.

The Northern Sea Lion, discovered by Behring, in 1741, is noted for its leonine expression and ferocity of countenance. It has an entirely different head from that of the southern species, having a pointed nose and flattened profile, like the northern Sea Bear. It is the largest representative of the Eared Seal family, the full-grown males often weighing from 1,000 to 1,300 pounds, and measuring from ten to thirteen feet in length, and from eight to ten feet in girth. The young are of a dark chocolate color, and the adults of a golden rufous or ochrey tint, the shade varying with the seasons. Its principal breeding places are on the Aleutian and Pribolov Islands in the Bering Sea; but the northern limit of its habitat is apparently determined by the southern border of the Polar floating ice, while its southern range extends to California on one side, and to Japan on the other side of the North Pacific Ocean. Although provided with flippers, apparently the same as those of the Sea Bears, these animals are unable to use them in the same free manner; for where the Sea Bears can be driven six miles, the Sea Lions can barely go two. They seldom raise their hind quarters from the ground, but draw them after the fore feet with a slide over the grass or sand. The Sea Lions do not leave the islands in the fall as the Fur Seals do to return in the spring; but remain there the whole year, keeping close to the shores near the stations even after the close of the breeding season, although they are only seen in small groups from the time the cold weather sets in late in December, or early in January, until spring once more frees the islands of ice and snow. The voice of the Northern Sea Lion is a deep, grand roar. Unlike the Northern Sea Bears, the Sea Lions have a marked affection for their young; the males often going into the water with the females to watch over the cubs, as they learn how to swim.

The California Sea Lion, or West Coast Seal, is also found on both sides of the North Pacific; but the northern boundary of its habitat is the southern limit of the range of the Northern Sea Lion. The general habits of these animals seem to be very similar to those of the Northern Sea Lion, but they utter a sharp bark, or howl, by which they can easily be distinguished even at night, when it is impossible to note differences in size and color and tructural appearance. The shape of the head of the California Sea Lion is different from that of all other Seals, resembling that of the dog-faced baboon. The cubs are almost black in color, but the general color of the adults is a chestnut brown, deeper on the under parts and limbs than on the back. The length of the full-grown males varies from seven to eight feet. California Sea Lions breed on the Farralone Islands and the island of Santa Barbara. During the hauling-up season they congregate there in vast numbers, and are considered one of the sights of California, summer visitors to San Francisco seldom failing to make excursions to Seal Point, about six miles from the city. As each of these animals consumes from ten to forty pounds of fish a day, it is a natural consequence that most of the thousands of Sea Lions who are seen in the neighborhood of San Francisco during the summer are obliged to swarm away in various directions in a quest of new feeding places at the close of the pairing season in September. This is the Sea Lion oftenest seen in captivity, as it seems to thrive better in that state than any other representative of its family. Its wonderful sagacity and activity are best illustrated by the method it pursues in capturing the Sea Gull. Sighting its prey, the Sea Lion will dive deeply and swim some distance under the water, then it will rise and expose the tip of its nose above the water giving it a rotary motion like a water buoy at play. The Sea Gull, attracted by the object, will alight to catch it, only to be seized and devoured by its wily foe.

Hooker's Sea Lion, found south of New Zealand; and the **Australian Hair Seal,** believed by many to be the missing link between the Fur and Hair Seals because the cubs have a soft thick underfur, which however disappears in the adults, are the remaining species of Sea Lions.

Sea Lions are too formidable to be taken in nets, or clubbed to death, and are generally shot with rifles. Where they congregate in large numbers, as on the Pribilov Islands, they are driven from the shore to a village from ten to twelve miles inland; the journey taking about five days. A man will get between the edge of the water and the herd, and by running at them with an umbrella, which he expands as he approaches, will alarm and rouse the rear line of animals, who will press forward upon those in front until the whole herd is in motion. By shouting and waving flags, at the rear and on the flanks of the herd, the Sea Lions are kept moving in the right direction until they reach their destination, or it is necessary to halt them for a rest. At the killing-grounds the full-grown males are shot with rifles, after which the slaughter is continued with lances. The skins are valued only for leather purposes; as the under fur, in the few cases where it is present, is very scarce.



SEALS SWIMMING.

FUR SEALS

We now come to the consideration of the most valuable and interesting of all Seals, the Sea Bears of the Eared Seal group, commonly called Fur Seals because they are the species possessing the soft, dense underfur which produces the beautiful "sealskin" of commerce. Of the eight different kinds of "sealskin" recognized in commerce, three—"Shetland," "Lobos Island" and "Cape" —are produced from the skins of the Southern Sea Bears; and five—"Alaska," "Victoria" or "North West." "Copper Island," "Robben Island," and "Japan"—are the products of the skins of the Northern Sea Bears. The variations in the quality, and size of the skins are due to differences in the age, sex and location of the habitat of the animals, rather than to generic distinctions. Fur Seals are valued only for the skins, as the oil obtained from them is too rank to be refined.

The Fur Seal is polygamous. Steller, its discoverer, found it living in families, numbering eight, fifteen, fifty, and in some cases even one hundred and twenty females to one bull. An exact account of the full birth rate of pups in 1912, showed an average family of sixty cows to one bull, with idle bulls to spare.

Shetland Seal is the name commonly given to the skins of all Sea Bears of the southern seas, but rightly it should only be applied to those taken from the Sea Bears of the South Shetland Islands and adjacent groups.

The cubs of this species are almost black, but the general color of the adults is a silvery grey, blending into a deep rich brown on the sides and the belly behind the flippers. The underfur is of a reddish or deep pink color, and being longer, softer and more abundant than that of any other species it produces the richest and most beautiful "sealskin." At one time Sea Bears were very numerous around the South Shetland, South Georgian, South Falkland and other islands of the Antarctic and Indian Oceans. In the year 1800, 112,000 skins were shipped from the South Georgian Islands alone, and 320,000 skins were taken off the South Shetland Islands. in 1820 and 1821; but the immense herds of Southern Sea Bears, at one time numbering up into millions, have been gradually reduced by overcatching, and the indiscriminate slaughter of the females and the young, until today a few hundred skins represent the entire catch of a year. Southern Sea Bears breed in December and January.

The Cape Horn, and Lobos Island, Fur Seals belong to the same genus and are in fact the same animal in different localities of its habitat. Like all Sea Bears of the Southern Hemisphere, these animals are longer and narrower and have more depressed muzzles than their northern cousins. The range of the species extends from the Gulf of Tres Monte to the Straits of Magellan in the Atlantic Ocean. They are most abundant on the Cordova Peninsula, and the Lobos Islands at the mouth of the LaPlata River, the best representatives of the species coming from the latter district. In color they are yellowish brown, with sides of a darker hue. As compared with the Northern species the fur of these Seals is longer and of poorer quality; but the skins are easy to work and take the dye well. They are used quite extensively for repair work. overcoat linings, and other purposes for which moderate-priced skins are demanded. The Lobos Island breeding grounds are under the protection of the government of Uruguay.

Other species of Southern Sea Bears are the "South Sea Seals" (Otaria-gazella) of the Crozet and Kerguelan Islands; the "San Louis Seal," of the same genus, frequenting Marion, Prince Edward and St. Paul Islands; the Lima Fur Seal; and the New Zealand and Australian Fur Seal (Arctocephalus-fostereri); but the first three species have been virtually exterminated; and the others are too poor in quality to be worthy of consideration.

Alaska Seal is a name which strictly speaking should only be applied to the skins of the bachelor Sea Bears taken on the Pribolov Islands in the Bering Sea; but many dealers do not hesitate to sell the skins of the Copper Island and other Northern Sea Bears of the same genus, as "Alaskas"; and some even go so far as to include the skins of all Fur Seals under this name. The reason for this will be apparent, when it is understood that the "sealskin" obtained from the Pribolov Islands skins is next in quality to the Shetland, and is superior to that produced from any other Sea Bear. The Northern Sea Bears would long since have shared the fate of the Southern species, if the United States government had not, in a measure, limited the catch, by confining the right to kill Sea Bears on the Pribilov Islands, to a company working under a lease from the government, and subject to government restrictions. When the lease of the North American Commercial Company expired in 1909, the government took over the management of its own business at the rookeries on the Pribilov Islands; and during 1910 and 1911 twenty-five thousand skins taken by the government on the Islands, were sold for eight hundred thousand dollars. Since 1847 no female Sea Bears have been killed on the islands.

The Alaska Commercial Company, who held the lease from 1869 to 1889, are said to have realized over $33,000,000, from the sale of furs during that time; and it is estimated that since the purchase of Alaska in 1867, citizens of the United States have received more than $50,000,000, for skins taken on the Pribilov Islands.

The payment of $7,000,000 to Russia for the territory of Alaska has proved a profitable investment for the United States; for, besides the profits that have accrued to individual citizens from the industry, the government has realized over $10,000,000 from the sale or leasing of the sealing privileges on the Pribilov Islands.

These figures do not include the duties paid on dressed skins, returned from London for consumption in the United States.

The Alaska Commercial Company paid the United States an annual rental of $50,000, and a royalty of $2.25 per skin, for the privilege of killing 75,000 male seals each year on the island of St. Paul, and 25,000 on the island of St. George.

Under the terms of the twenty-year lease secured by the North American Commercial Company in 1889, no dogs or vessels, other than those in the employ of the company, were permitted to touch at, or to land persons or merchandise on the islands of St. Paul and St. George, except in case of shipwreck or distress; and the company was obligated to pay the government a yearly rental tax of $2.00 per skin, for the privilege of killing each year 20,000 bachelor Seals, between the ages of one and five years. In addition to the payments to the government the company was obliged to furnish the natives of the islands mentioned, such quantities of salt, and such a number of barrels, as they might need for the preservation of the meat kept for food, and eighty tons of coal annually; to erect, and keep in repair, comfortable dwellings, and a suitable house of worship; to establish, and maintain for eight months each year, proper schools for the education of the young; to provide competent physicians and medicines for the sick; and to supply the widows and orphans, and the aged and infirm inhabitants of the islands, with the necessities of life. The government reserved the right to change the terms of the lease at any time by giving due notice of its intentions, and required the company to deposit, with the United States Treasury at Washington, the sum of $50,000 as a guarantee fund.

The only change made in the conditions of this lease was one limiting the catch to 15,000 skins yearly, and obliging the company to brand and sequester one thousand each of one and three-year-old male Seals before the killing commenced. In spite of all restrictions it is claimed there had been up to 1906 a falling off of forty-two per cent. in the number of breeding males or bulls, and the Congressional Committee having the matter in charge recommended the entire suspension of killing on the islands for a number of years, as the only way to prevent the complete extermination of the species. Those who made a careful study of the subject were however convinced that, inasmuch as the proportion of males and females is about the same at birth, the polygamous nature of these animals will safely allow the killing of six or even nine out of every ten males. They therefore claimed that the preservation of the herd did not depend upon further protection for the males on the islands, but upon the cessation of pelagic sealing, which results in the destruction of at least three lives for every skin taken—the mother, the unborn offspring and the nursing pup. That this was not an idle contention is proved by the fact that in 1896 over 16,000 young Seals were found dead from starvation on the Pribilov Islands because they had been deprived of their natural sustenance; while careful estimates, made in 1897, showed that since the beginning of pelagic sealing 300,000 young Seals had died as the direct result of the slaughter of 400,000 adult female Seals at sea.

"Originally descended from a land animal, the Fur Seal has become adapted to life in the open sea, and seeks the land only for breeding purposes. When the young are able to care for themselves, and on the approach of winter, the animals leave their island home and the long migration down the Pacific Ocean to the latitude of Santa Barbara in California begins. The return journey, which brings them back to the island, is not completed until June of the following year. The food they consume on the islands in the summer is procured at a distance of from one hundred to two hundred miles from the rookeries."

The Indians have always hunted the stragglers from the migratory herd who came within reach of the shore, but it was not until the spring of 1879, that sailing vessels were used, to take the hunters out to meet the main body of the herd, and follow its course northward. In time the hunting extended to the summer feeding grounds in the Bering Sea, where the female Seal was the chief victim because of the greater regularity of its feeding, leaving many unprotected young to die of starvation.

Beginning with the catch of eight thousand in 1879, the number of Seals taken annually by Pelagic sealers steadily increased on account of the extension of the fleet; and in 1894, sixty-one thousand skins were taken. Since 1894, the pelagic catch has declined, with the declining herd; but the actual toll, in the period from 1879 to 1911, exceeded one million without taking into account the seals killed but not recovered. As the adult males do not as a rule accompany the female and their young on the long journey to the south, eighty-five per cent. of the animals destroyed by pelagic sealers were females.

The United States attempted to stop pelagic sealing years ago, and in 1886 seized a number of British vessels found pursuing the industry in waters declared closed by this government. England however successfully contested the claim of the United States to jurisdiction in the Bering Sea outside of the three-mile limit, but the International Tribunal, which sat in Paris in 1893, and decided against the claims of this government, as a compromise measure established a close season from May 1st to July 31st, in both the North Atlantic and North Pacific Oceans; and excluded all killing in the waters within sixty miles of the Pribilov Islands, These conditions, however, failed to accomplish the desired result; and the herd, which in 1874 numbered over 4,000,000, and in 1891, 1,000,000, had in 1909 been reduced to less than 200,000.

A treaty was finally concluded on July 7, 1911, by which the Governments of the United States, England, Japan and Russia agreed to co-operate in abolishing pelagic sealing for fifteen years. In this treaty it is agreed; that the United States and Russia, as the owners of the principal fur seal herds, shall each pay to Great Britain and Japan, fifteen percent of their land sealing operations. This treaty went into effect in 1912, and it is estimated that as a result fifteen thousand breeding fur seal females, who under the operation of pelagic sealing would have failed to reach the islands, brought forth their young at the rookeries. This fact alone demonstrates the cause of the herd's decline as well as its ability to restore itself if protected from further loss from this source. On February 15, 1912, a bill, which has since become a law, was introduced in the House of Representatives to give effect to certain provisions of the treaty of 1911. An effort was at once made to attach to this bill an amendment providing for the suspension of all land sealing during the period of the treaty. The amendment was defeated as originally offered, but a compromise was finally effected fixing the period of the suspension of land sealing at five years, and permitting only the killing of a limited number of the animals as food for the natives on the islands; and that is now the law.

As the essential consideration in the treaty of 1911, is the agreement of the United States and Russia, to give to Great Britain and Japan each fifteen per cent. of the land catch, to compensate the pelagic sealers; this action was an actual repudiation, by this government of the terms of the treaty, and for a time threatened to lead to its abrogation by Great Britain and Japan, as the killing of the superfluous males on the islands would yield more than twelve thousand skins annually, while killing for food supplies alone would not allow of the taking of more than from three to five thousand.

Apart from the question of bad faith, it is the judgment of those who are posted on this subject that the cutting down of the number of bachelor seals to be killed on the islands from the number provided in the treaty, will result in the existance, in 1917, of at least thirty thousand superfluous bulls, who in their struggles to establish their harems, will not only destroy one another, but many of the female and the young as well. The amendment, instead of helping to conserve the herd, will hasten its destruction. Statistics show that only fifteen hundred bulls were needed for the herd on the island in 1912.

Another thing about which those who voted for the amendment seemed to be ignorant of, is the fact that the carcasses of the seals are needed for the sustenance of the blue foxes, and other subsidiary life on the islands. As the government has taken forty thousand blue foxes during the time it has been in possession there; and as the skins of three year old bachelor seals are worth forty dollars apiece; it is easy to calculate the money loss to the government by the passing of this amendment.

Previous to this the United States Congress, in 1890, passed laws prohibiting American vessels from engaging in pelagic sealing, and preventing the bringing into this country of the Victoria or Northwest Coast skins which are the fruit of this industry. In the absence of co-operation on the part of England, Russia and Japan the only result of this legislation was an increase in the number of Canadian and other foreign vessels engaged in the work of indiscriminate slaughter; and it looked as if, for want of united action on the part of the great maritime powers interested, it would be only a short time before human greed and folly would so reduce the number of Sea Bears, in northern waters, that their pursuit would no longer be profitable. Referring to this condition in a message to Congress, President Roosevelt said: "In case we are compelled to abandon the hope of making arrangements with other governments, to put an end to the hideous cruelty now incident to pelagic sealing, it will be a question for your serious consideration how far we should continue to maintain and protect the Seal herd on land, with the result of continuing such a practice; and whether it is not better to end the practice, by exterminating the Seal herd ourselves, in the most humane manner possible."

There was considerable difference of opinion as to the wisdom of the President's suggestion and a joint resolution introduced in the Congress, in 1907, providing for the killing of all female Seals on the islands down to a minimum of not less than 10,000, and of all male Seals down to a minimum of not less than 1,000, was killed in the House Ways and Means Committee. The opponents of the measure justly claimed that if such reduction was desirable, the Secretary of Commerce and Labor should be empowered to authorize the North American Commercial Company to kill the Seals on the islands down to the number designated, and thus accomplish the result aimed at without any violation of the contract with the lessees, or expense to the government, which on the contrary would receive the sum of $10.22 for every skin thus taken by the lessees.

It was the judgment of the writer at that time that there should be no change in the provisions then existing for the killing of Sea Bears on the Pribilov Islands, unless England, Russia and Japan would agree to a convention to put a stop to pelagic sealing in northern waters; and that in the absence of such an agreement, the United States government should, at all times, keep a sufficient force on the islands, and in the Bering Sea, to compel the observance of the regulations of the Tribunal of Paris, and to prevent the possibility of a repetition of such a raid as was made on the Island of St. Paul, in June. 1906, by the crews of Japanese vessels. He claimed it was also imperative for the better protection of American interests in the Pribilov Islands, that the restrictions regarding the landing of aliens and citizens upon the islands of St. Paul and St. George should be made to apply to Sea Otter, Walrus, and Sea Lion Islands as well, so that designing persons would not have it in their power to establish a base of operations within easy reaching distance of the rookeries.

Hutchinson Hill Rookery, on the Island of St. Paul, is the principal breeding place of the Alaska Seals. During the winter the island is deserted, the Seals, late in the fall, following the southward migration of the fish upon which they feed. The first males to revisit the old haunts, in the following spring, are very shy and sensitive; and will spend several days swimming around among the rocks before venturing to land. The first arrivals, though not always the oldest, are generally the finest specimens, of their race who are fully capable of maintaining possession of the stations they may select. As a rule the males do not re-occupy the same stations year after year, although some will occasionally do so for a number of seasons. Only a few of the bulls come ashore in May, but when the humid, foggy, summer weather sets in, about the first week in June, they come up, fat and sleek, by hundreds and thousands, and having selected their stations, prepare for the reception of the females who begin to arrive from three to four weeks later.

The first females to land are always received with marked attention by the stronger bulls, who by virtue of their superior prowess have succeeded in securing possession of the most available stations nearest the shore. They are seldom allowed to remain long with these however, as the males from the more inland stations take possession of them the first time their masters are away on the outlook for new additions to their harems. In this way some of the unfortunate females are again and again taken by the scruff of the neck, as a cat seizes its kittens, and passed on from station to station until they find security at last in one of the families farthest away from the water. By the time the last batch lands late in July, the males have become so exhausted by constant fighting, and the stations have become so fully occupied, that the late arrivals are allowed to crowd their way unmolested through the fifteen or sixteen rows of stations intervening between the shore and the open ground, to the rear of the colony. There they congregate in droves, always being careful however to select positions where there are no depressions in which the water can collect in puddles.

Pairing begins immediately after the birth of the cubs, who are born shortly after the landing of the females, and come into the world with their eyes open. At birth the young Sea Bears weigh from three to four pounds, and measure from ten to twelve inches. Their skins are valueless, but many of the young Seals are killed by the natives for food. The females make frequent visits to the sea after the birth of their offspring, and the cubs at such times gather together by thousands. A mother Seal upon her return from the water never has any difficulty, however, in singling out her own offspring by its cries, but will without a moment's hesitation and with unerring certainty push her way direct to the spot in the assembly where it happens to be.

Early in August the bulls leave their families, and the majority of them do not return to the islands after going to the sea; and those who do come back, instead of returning to their stations, remain near the shore until the colony migrates in the fall. After the departure of the males the family parties break up; the females and the cubs, together with the older males who did not succeed in getting partners, and the younger males who up to this time have been prevented by their older brethren from gaining a footfold on the shore, take possession of the entire sea area in a very disorderly manner. At this period the females spend three-fourths of their time in the water, and the cubs nearest the shore make their first attempts at swimming. Though at first they are very awkward and tire quickly the cubs soon become adepts at the art, and by the middle of September all the young have become thoroughly familiar with the water. and have deserted the higher ground to take positions on the rocks and beaches near the water's edge, where they remain until the southward migration of the colony begins a few weeks later.

By November the islands are deserted by the great mass of Sea Bears, although a few remain until driven off by the ice and snow in December.

The Sea Bears, which the lessees had the privilege of killing on the Pribilov Islands, are the males from one to five years old called "Hollus-Chuckie" or Bachelor Seals by the natives, because they are not allowed by the old bulls to mix with the females.

The Bachelor Seals arrive at the islands early in the season, but they are not compelled to undergo any long periods of fasting. Even when they take a position in the rear of the colony, they are allowed to make their way to and from the beach through passages between the stations.

The hauling ground they select however is generally a space on the beach at some distance from the stations and extending about a quarter of a mile inland. They are restless creatures, but though very sportive and frolicsome they never quarrel or fight. They only keep to the shore on dull, foggy days. When it is bright and warm they spend most of their time in the water; doing all kinds of fancy tumbling, jumping out of the water like so many dolphins, or describing beautiful elliptical curves, as they rise three or four feet from the sea, with the back slightly arched, and the fore flippers folded back against the sides while the hinder limbs are extended and pressed together straight out behind.

The fact that the Bachelor Seals are compelled to herd by themselves, frequently miles away from the breeding grounds, greatly facilitates the arrangements made for their slaughter. Some morning early in June, the time when the skins are at their best, a company of natives will run along the beach; and having turned them inland from their hauling grounds will drive the animals at the rate of a half a mile an hour to the place of slaughter. At the killing-grounds the herd is first allowed to rest and cool, and then they are drawn off in "pods" or detachments of from fifty to a hundred each, and despatched by being knocked on the head with oaken bludgeons. The killing gang always have an understanding as to what grades are to be killed, and permit the others to escape and make their way back to the sea. In the days before the limitation of the catch, a party of forty-five natives would drive, kill and skin upwards of 72,000 Seals in four weeks. Now there is no occasion for such haste, and more time can be given to the careful selection of the animals to be killed.

"The female Seals are protected by law and custom from killing; and breeding seals are never disturbed. The three-year-old, and large two-year-old bachelors are the animals killed; the younger, and older animals being allowed to return to the sea; the former to be the basis of a future killing quota, the latter to replenish the stock of breeding males."

"The processes of driving and killing are simple and humane. The fur seal is well adapted to land travel to the extent to which it is necessary to drive the animal. The powerfully developed muscles of the fore limbs on which it depends in swimming are the ones used in land locomotion. Though of strong instincts the fur seal is not an animal of high intelligence, or susceptible to injury by nervous strain. The processes of land travel do not contravene that natural law which decrees that the fittest shall survive."

As the skins will spoil in a few hours if they are not flayed at once, and properly salted, they are taken from the field to the salt-houses as quickly as possible; there they are laid out flat, one skin upon the other, in bins or on benches, salt being spread thickly over the pelt side of the skin. After lying in the salting bins for two weeks the skins are taken out and rolled pelt to pelt, in bundles of two skins each, and strongly corded. In this shape they are packed in casks, containing from forty to fifty skins each, and shipped to the point where they are to be sold at auction in December. Before being offered for sale the skins are sorted according to the following classification:

Middlings and Smalls	4 to 5	years	old
Smalls	4	"	"
Large Pups	3	"	"
Middling and Small Pups	2	"	"
Extra Small and Grey Pups	1	year	"

The average price for raw seal-skins in 1888 was 78s. each, and the figures, showing the prices obtained at the December sale in 1906, prove that they had increased three hundred per cent. in value up to that time. There was a further increase of more than fifty per cent. during the period from 1906-1913.

After being thus sold in the rough state the salted skins are sent to the dressers by the purchasers, and there and at the dyers they are changed by various processes into the beautiful seal-skin exhibited by the furriers.

First the strips of blubber and flesh still adhering to the skin are removed with a blunt knife, then the ears are cut off, and the skins are washed in warm alkali water; next they are stretched on hoops and dried in warm rooms where currents of hot air pass over them; after this they are soaked in water so the hair is loosened without effecting the underfur. Then the skins are warmed on the fur side, and the top hairs removed with a blunt knife. The skins, which now have nothing but the fur on them are then rubbed to soften the leather, shaved, repaired, and sent to the dyer's.

At the dyer's, the skins are limed back to back, with a thick layer of paper over the paddle holes to prevent the dye from going through and damaging the skin by being absorbed by the pelt. The ground color is then trodden in, and after this has thoroughly dried the necessary coats of the top color are applied with a brush or by dipping. When the dying process has been completed the skins are scraped and shaved, and cleaned in a revolving drum containing saw dust; and finally are machined to remove the fine water hairs. The entire process by which the raw hide of the Sea Bear is converted into the "sealskin" of commerce takes from three to four months, and greatly increases the value of the skin.

The sea migration of the males of the Pribilov Island colonies is unknown. The females and the young of both sexes pass out through the Bering Sea into the North Pacific, where they are known as Victoria or North West Coast Seals because some of them are speared on the North West Coast of British Columbia by the natives, who go out in canoes to take them. Most of the Victoria Seals however are taken in deep water as before stated, and the United States, in its war against pelagic sealing, has declared the skins of the Victoria Seals to be contraband, and to prevent their introduction into the country in manufactured garments or other articles has found it necessary to adopt such stringent customs regulations that it is often difficult for tourists, not familiar with the requirements of the government, to get their own American-made garments back into this country after taking them abroad. There need be no trouble on this score however if American going abroad will take their sealskin garments to the custom house at the port of departure before leaving and have them registered, receiving at the same time an order for their re-entry into this country.

Pelagic sealing is carried on by well-appointed schooners, and other vessels. When the Seals are sighted, swimming or sleeping in the water, small boats are lowered and the hunters are rowed to the sealing-ground by the sailors. The percentage killed is very small, for in a great majority of cases the Seal will take alarm and dive before the hunter can get within range; and even when a Seal is shot it commences to sink so quickly that the boat has to be pulled very rapidly up to the carcass if it is to be gaffed and pulled abroad. At the end of the day's hunt the boats return to the vessel, and the Seals are skinned and the pelts salted and laid away in the hold.

While the headquarters of the Northern Sea Bears are on the Pribilov Islands, these animals are also found in other parts of the Bering Sea; and on both shores of the North Pacific, as far south as Victoria on the American side, and the island of Saghalien on the other. Thus it will be seen that the Alaska, Copper Island, Victoria, Robben Island and Japan Seals are all species of the same genus; differing in quality, color, form and size, according to locality and sex, but having the same disposition and habits.

"Victoria" Seals, being the females of the same species, are of course much smaller than Alaska Seals, and the fur, though beautiful to look at, is less durable than that on the skins of bachelor Seals; and the money value of the skins, figured inch for inch, is about one-third less than that of the bachelor skins taken on the Pribilov Islands.

Copper Island Seals, breed on the Commander Islands, about two hundred miles east of Kamschatka. Their habits are identical with those of the Alaska Seals, of the Pribilov Islands, and some authorities claim that they are the same species in a different locality. However that may be although some of the Copper Island skins are very fine, the fur of these animals is not as rich as that on the Alaska Seals, and the money value of the skins is considerably less. The difference in the quality of the two species is probably due to climatic influences. The general migration of this species is along the east coast of Japan. The Alaska Commercial Company for years held a lease from the Russian government, allowing them to kill 30,000 Seals, annually, on the Commander Islands.

The fur of the skins taken from the Sea Bears found on **Robben's Island,** south of Kamschatka, is of poorer quality than that of the Copper Island skins; and consequently of much lower value. **The Japanese Sea Bear** has the shortest, and thinnest fur, of all Northern Fur Seals; and the skins of this species are used principally for the manufacture of caps, and other small articles, where a short fur is not objectionable.

Northern Sea Bears show considerable variation in color, both in the underfur and the top hair. In the adult males the general color of the upper parts, with the exception of the shoulders which are a decided grey, is nearly black, with a more or less marked grey or reddish grizzle. The sides of the nose and lips are brownish, the breast is brownish orange, and the limbs and under parts, are reddish brown. The females, and the bachelors, are lighter in color; being uniformly grey above, with under parts of brownish or rufous color. In both sexes there are individual variations due to the varying proportion of grey hair. The color of the Copper Island Seals is lighter than that of the Alaska Seals, being a dark brown. The Robben Island Seals are yellower and coarser-haired than either of the above, and their short even under-fur is red. The skins taken on the Japanese Islands are mostly those of female Seals, with yellow necks and cheeks. The males are called bachelors from the time they cease to be yearlings until they are six years old, and from that time until they become fully materialized bulls at seven years of age they are classed as half bulls. All Seals under two years are yearlings. At two years the females are designated as virgins, and at three years as cows. The males when undisturbed will live from fifteen to twenty years, and the females nine or ten years.

The difference in the dimensions of the sexes is greater in the Northern Sea Bears than in any other species of Eared Seals. The old bulls weigh from 700 to 800 pounds, and measure from seven to eight feet; while the full-grown cow only weighs from 80 to 100 pounds, and measures about four feet in length, and two and a half feet in girth. The finest fur is obtained from the skins of the three-year-old Bachelor Seals, which weigh about 100 pounds, and measure from four to five feet in length, and a little over two and a half feet in girth. As the animals grow older the fur becomes longer and loses in density until in the old bulls it is so long and thin that they are sometimes called wigs.

All the Northern Sea Bears have a short face, with a sharp profile; but the other species have a slenderer head than those frequenting the Pribilov Islands; this is especially true of the Copper Island Seals.

The cows of this group have but one note, a hollow prolonged, bla-a-ting call; but the males utter four distinct notes—a loud, long, hoarse roar, a low gurgling growl or chuckle, a sibilant piping whistle and a kind of spitting sound. Mr. Elliott says: "The sound arising from the great breeding grounds of the Fur Seals, where thousands upon thousands of angry bulls are roaring, chuckling, piping; and multitudes of mother Seals are calling in blaating tones to their young, who in turn respond incessantly is simply indescribable, and under favorable conditions can be heard five or six miles away; often warning vessels that are approaching the islands in thick, foggy weather, of the positive, though unseen proximity of land. Night and day, throughout the season, the din of the rookeries is steady and constant."

Both Sexes of these animals have a marked indifference for their offspring, cases being on record where a cub has been killed before the eyes of its mother without causing the parent to show the least concern.

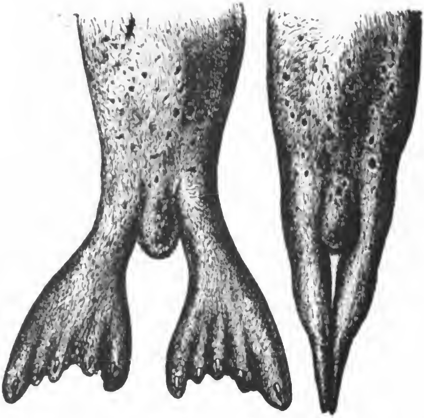
The hauling grounds of the bachelors are always on the beaches, but the rookeries of the bulls are on the rock-covered slopes back from the shore.

All Northern Sea Bears are impatient of heat. A temperature of 45° is unpleasant to them, and when the mercury in the thermometer rises to 55° or higher they suffer great inconvenience; and the rookeries, at such times, present a peculiar appearance, because the distressed Sea Bears spread out in every conceivable position their bodies can assume and try to obtain relief by briskly fanning themselves with their hind flippers, while they hold the front flippers aloft so as to form a sort of ventilator for the air to pass through.

In their native element these animals are as graceful and quick in their movements as they are slow and clumsy on the land. In commenting on this fact, Mr. Elliott says: "Sea Bears of all ages swim with great rapidity, and may be fairly said to dart along under the water, with the velocity of a bird on the wing. The fore feet can be seen to work, feathering forward, and sweeping back flatly opposed to the water, with great rapidity and energy, and are evidently the sole propelling power; for if the long, flexible hind limbs have any propelling power, or are used otherwise than as a steering medium, my eye has never been quick enough to detect it."

A census of the seal herds taken by the agents of the Government, showed that there were on the Pribilof Islands in 1913, 1,403 active bulls with harems, 364 idle and young bulls, 47,000 one, two, three and four-year-old pups, 92,269 young pups, with an equal number of breeding cows, and 35,000 one and two-year-old cows.

The number of seal skins shipped from the islands in 1912 to C. M. Lampson and Company in London and sold for the Government was 3,764. Under the leasing system, which prevailed prior to 1910, the Government would have received $38,589.25 for these skins, instead of the $130,640.57, which represented the net proceeds of the sale.



FLIPPERS OF THE TRUE SEAL.

INSECTIVORA.

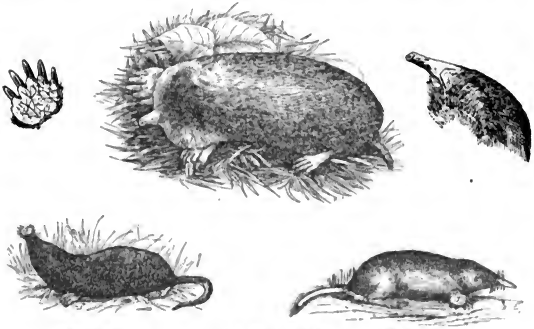
Insectivora are small mammals with carnivorous tendencies, that are compelled by their inferior size to depend principally upon insects for their supply of food. On account of differences in the development of their incisor teeth, these animals were distributed by Linnaeus among several orders, but Cuvier in 1816 grouped them together in one independent order, all the species of which have teeth encased in enamel, and grinders studded with conical points. which distinguishes them from the Mónotremes, while the peculiar clondyles of their jaws separate them from the rodents, and their limbs distinguish them from the bats. As Dr. Theodore Gill says, the various types of Insectivores differ so much in external characteristics that it is only possible to give general characters to the order. They commonly lead a nocturnal and subterranean existence, and in cold climates many of them pass the winter in a lethargic state. Their feet and legs are generally short, and their motions are feeble; in walking they place the whole sole of the foot on the ground. Some of them have long incisors in front, followed by other incisors and canines shorter than the molars. Others have large separated canines, between which are placed small incisors. Some species are covered with robust spines, while others have the finest and softest fur; some have barrel-shaped bodies, minute eyes, and wide, sharply-clawed fore-feet fitted for digging; some are ground animals with mouse-like forms, and still others are squirrel-like and arboreal. Formerly the naturalists called all the round, digging Insectivores Talpidae; and those with mouse-like forms Soricidae, but now they are divided according to structural characteristics, into a dozen different families, the most important of which as a fur producer is the Talpidae, of which the Common Mole (Talpa-europaea) is the principal representative.

The European Mole is about four inches long, has extremely small eyes that are almost hidden by the thick fur which prevents the dirt from entering them when the animal is burrowing. It has no external ears, but the openings can be distinguished just above the fore-feet; the long naked snout is furnished with a few black whiskers, and the one inch tail has a scanty covering of bushy hair, which is most abundant at the tip. The fur on the body is short and very fine and silky, the color generally being a peculiar shade of lustrous brownish grey that has become very popular with fur wearers.

Moles are entirely insectivorous and usually feed early in the morning and again in the evening, boring long tunnels in the ground in pursuit of their prey. Their nests are made by throwing up the earth in hillocks with their fore feet, which are very large and furnished with five strong, sharp claws that turn outward. In some parts of England Mole catching is a regular business; they are sometimes captured with spring traps, but can be easily taken, before eight in the morning or after six o'clock in the evening, by placing a spade a few inches below where they are working and catching them with the hand; as the long passages they make under the earth are clearly visible on the surface this is easily accomplished. In severe frosts the moles sometimes seek shelter in the hedges, but they never hibernate, but work all through the winter. The inconvenience they cause by spoiling walks and uprooting plants, is more than compensated by the service they render in draining the subsoil of meadows, and in destroying the larvae of insects that would become a pest.

Moles have well developed senses of smell and hearing and are good swimmers, and are found in the hill country as well as on the bottom lands.

Bell, in his History of British Quadrupeds, gives an interesting description of the way in which each Mole confines itself to its own district or encampment. He says: "Within its limits, or at least in immediate communication with this district, all the labors of the animal are pursued. It consists of the habitation or fortress, from which extends the high road by which the animal reaches the opposite extremity of the encampment, and of various galleries or excavations opening into this road, which it is continually extending in search of food, and which constitute, in fact, its hunting-ground. The fortress is formed under a large hillock, which is always raised in a situation of safety and protection, either under a bank, against the foundation of a wall, at a root of a tree, or in some similar locality. The earth, of which the dome covering of this curious habitation is composed, is rendered exceedingly strong and solid by being pressed and beaten by the mole in forming it. It contains a circular gallery within the base which communicates with a smaller one above by five nearly equidistant passages; and the domicile or chamber is placed within the lower and beneath the upper circular gallery, to which last it has access by three similar passages. From the chamber extends another road, the direction of which is at first downwards for several inches; it then rises again to open into the high road of the encampment. From the external circular gallery open about nine other passages the orifices of which are never formed opposite to those which connect the outer with the inner and upper gallery; these extend to a greater or less distance, and according to De Vaux return, each taking an irregular semicircular route, and opening into the high road at various distances from the fortress. Such is a very hasty description of this most singular structure; and nothing surely can be imagined more admirably calculated to ensure the security or the retreat of the inhabitant than such an arrangement of internal routes of communication as this. The chamber communicating



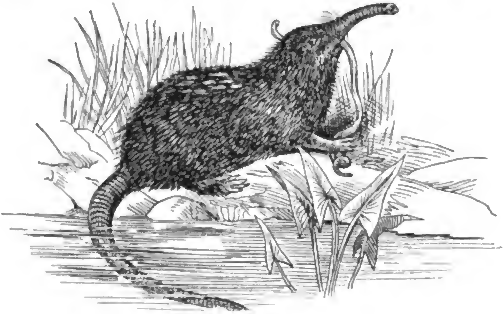
STAR MOLE. COMMON MOLE. GARDEN MOLE.

beneath directly with the road, and above with the upper gallery—this with the lower five passages, and the latter again with the road by no less than nine—exhibit altogether a complication of architecture which may rival the most celebrated erections of the beaver.

"But the labors of the mole are not confined to the excavations already mentioned. In lands newly sown in summer with barley or turnips, the surface of which is consequently light and yielding, after a moderate rain has brought the earth-worms to the surface, the mole follows them and pursues its chase along the superficial layer of the soil, digging a shallow continuous trench, in which work it advances with great rapidity. This is done by merely forcing its way through the light soil, and thus lifting it up; and mole-catchers take advantage of these times to steal softly upon them, and throw them out of the ground with their paddle. But great quickness is necessary in doing this, for the mole will bury itself again so rapidly as often to escape, even when fairly thrown on to the surface. We have on more than one occasion seen a mole making so shallow a run that the fine soil has fallen away on each side, leaving the creature's back exposed to view. It is said that the gravid female, to whom the usual excavations in the subterranean alleys would be too laborious, limits herself principally to this lighter toil."

THE DESMAN.

The Desman (Myogale-moschata), sometimes called the Russian Muskrat, and also the Wuychuchol or Musk Shrew, although it approaches nearer to the Mole in appearance than the Shrews, has comparatively narrow feet that are not specially fitted for digging like those of the great burrowing Insectivores. It is a peculiar looking little animal about ten inches long, exclusive of the six inch tail. It has no external ears and the eyes are very small. The muzzle is elongated into a small four inch proboscis which is constantly in motion. The tail is scaly and flattened at the sides, and makes a powerful swimming organ, and the feet have the five toes fully webbed so the animal is entirely aquatic. It lives in burrows in the banks of the lakes and rivers of its habitat, the entrances to which are beneath the surface of the water.



DESMAN.

The Desman feeds on insects, leeches and similar food, which it finds in the mud and beneath the stones. There are four genera of the family found in different parts of Europe and Asia, and one in South America; but the type representative of the family Myogalidae is the species described in this article, which is confined to southeastern Europe and western Asia. Like the otter and other aquatic animals, the Desman has an outer coat of long stiff hairs to protect the fine, dense, soft, short under-fur, which is purplish brown on the back, and silvery white on the belly, and is used to some extent for trimmings, glove tops and similar purposes.

MARSUPIALS.

"Marsupials are peculiar in the premature production of their young, whose state of development at birth is hardly equal to that of the ordinary foetus a few days after conception. Incapable of motion and hardly exhibiting the germs of limbs, or other external organs, these diminutive beings attach themselves to the mammae of the mother, and remain fixed there until they have acquired a degree of development similar to that in which other mammals are born. The skin of the abdomen is so arranged as to form a pouch, in which the imperfect little animals are carried about, as in a second uterus; and to which, long after they are able to walk, they fly for shelter upon the approach of danger. Two particular bones, attached to the pubis, and interposed between the muscles of the abdomen, support the pouch. These bones are also found in the males, and even in those species in which the folds that form the pouch are scarcely visable."

It is a peculiarity of the Marsupials that in spite of a general resemblance in appearance, the species vary so much in the formation of their teeth, and feet, and organs of digestion, that they really should be separated into several special orders. Cuvier says: "They carry us by insensible gradations, from the Carnivora to the Rodentia; and actually form a distinct class, parallel to that of Quadrumana or Primates, and dissolvable into similar orders."

R. Ramsey Wright, in an article written for the Riverside Natural History, says:

"A glance at the map of the world will show the very curious distribution of existing Marsupials. All the families but one have their home in the Australian region; that is, either on the continent of Australia, the Island of Tasmania to the south, Papua or New Guinea to the north, Celebes to the northwest, or, finally, on the small islands which lie to the east and west of Papua. The remaining family (the opossums) is confined to South America and the southern parts of North America. The characteristic difference between the Australian and

American Marsupials extends also to the fossil forms found in these regions, for the earliest marsupial remains which have been detected in both countries are distinctly allied to the existing Fauna.

"In none of the orders of the higher mammalia do we find such wide limits as to the size of the body, for the order includes kangaroos as tall as a man, and little mouse-like creatures of dwarf proportions. The fur is in most cases long and soft, its coloring rarely very marked, and often very sober. In the structure of the skeleton the Marsupials are rather allied to the higher mammals than to the Monotremes. The lower jaw is always characterized by the inflection of the angle, a peculiarity which has assisted in the recognition of the marsupial character of the earliest fossil mammalian remains, which almost invariably consist of lower jaws. The number of bones in the vertebral column is remarkably constant, except in the caudal region, the tail being more or less rudimentary in the Wombat and Koala, but well developed in the Kangaroos and Phalangers, serving the former species as a sort of fifth leg, and being used by the latter in climbing.

"The relative length of the fore and hind limbs is very different in the different groups, the difference being especially striking in the kangaroos, where the fore limbs are particularly short. The bones of the fore arm are distinct, and allow of a rotary motion, the one around the other; the same is true of the bones of the hind legs in the climbing forms, but in the leaping forms such rotation is not possible. Of the toes of the hind feet, the inner one is sometimes opposable after the fashion of a thumb. This inner toe may be absent, or the second and third next it may also disappear or be much reduced.

"The brain of the marsupials is small, and consequently the cavity of the skull is relatively small as compared with the bones of the face. The surface of the brain is almost destitute of convolutions, and the two halves of the brain are less intimately joined by the corpus callosum than is the case in the higher animals.

In the number and arrangement of their teeth the different families of Marsupials differ from one another more than those of the higher orders. The vegetable feeders have teeth with constantly growing roots like those of the Rabbits. In the insect and flesh eating pouched mammals the roots of the teeth do not increase; and the canine teeth, which are well developed in the carnivorous forms of the order, are absent or very much reduced in the vegetable feeders. It is also worthy of notice that, with the exception of the Wombat, most of the Marsupials have an unequal number of incisor teeth in the upper and lower jaw. The premolars are double fanged and are usually $\frac{3}{3}$ on each side. The commonest formula for the true grinders is $\frac{4}{4}$, but in the Banded Ant Eater it rises to $\frac{6}{6}$ and in the flying Phalanger falls to $\frac{3}{3}$. In the Kangaroos the mode of succession of the teeth is singular, the hinder ones eventually replacing in function those in front as the latter become worn away.

"The stomach also varies in shape with the food, being simply oval or rounded in the carnivorous or insectivorous forms, while in the herbivorous kangaroos it is converted into a gut-like tube, sacculated like the colon, sometimes as long as the body, and occasionally provided, near the entrance of the gullet, with two blind sack-like appendages.

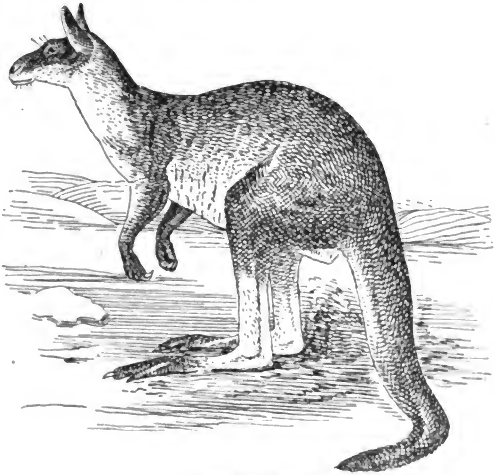
"The most preposterous theories as to the mode of development of the kangaroos were at one time credited by the Australian colonists and even by naturalists. It was thought that the young were formed at the end of the teat, and indeed the intimate connection which exists between the teat and the young readily explains such a popular conception. Now, however, ripe embryos have been discovered in the uteri, and such have also been observed a few hours after their fixation to the teats. There appears to be no doubt that the transference of the young from the womb to the pouch is effected by the mother's lips, the fore-paws being only employed to hold the lips of the pouch widely open. Both transference and fixation are, however, difficult to observe, for the little embryo, hardly an inch long, is first concealed by the lips of the mother, and then more effectually so by the insertion of the mother's head into the pouch. Even in the largest member of the family, the giant kangaroo, the young, when born, are no larger than a newly-born mouse. It is interesting to compare the degree of development of the hind and fore legs at this stage. While in the fore feet the five fingers are distinctly formed, even to the tips of the claws, the hind feet are more like short fins slightly notched into three lobes, the inner of which is again perceptibly divided, in correspondence with the structure of the adult foot. One of the most remarkable features about the young kangaroo is the largely-developed mouth and tongue; by their aid the little creature is able to grasp the teat firmly, and in fact the orifice of the mouth may grow smaller after the teat has once been firmly secured in it. The milk is injected into the gullet of the young, passing on each side of the upper end of the windpipe which is carried as far up as the hinder part of the nasal cavity. In this way the little creatures may breathe, and be fed at the same time, without danger of choking. The injection of the milk is effected by a specially modified part, the cremaster, of one of the superficial abdominal muscles. The epipubic, or so-called marsupial bones, serve as a sort of pulley by which the cremaster muscles are enabled more effectively to compress the milk glands.

"The duration of the pouch-life of the young varies with the species. The Kangaroo, according to Owen, suckles her young for eight months. During this period the hind legs and tail assume a great part of their adult proportions; the muzzle elongates, the external ears and eyelids are completed, and the hair begins to develop about the sixth month; at the eighth the young kangaroo may be seen frequently to protrude its head from the mouth of the pouch, and to crop the grass at the same time that the mother is browsing. Having thus acquired additional strength it quits the pouch, and hops at first with a feeble and vacillating gait, but continues to return to the pouch for occasional shelter and supplies of food till it has attained the weight of ten pounds; after this it will occasionally insert its head for the purpose of sucking, notwithstanding another foetus may have been deposited in the pouch, for the latter attaches itself to a different nipple from the one which had been used by its predecessor.

THE KANGAROO.

Nearly all the twenty-three species of Kangaroos are restricted to Australia, although a few are found in New Guinea. The family, which embraces the Kangaroos and their allies the Wallabies, includes not only the largest forms, but also has the greatest number of genera and species, and the widest geographical range. It owes its name, Macropodidae, to the difference between the size of the fore and hind legs. Kangaroos are entirely herbivorous, and the lower incisors, which are elongated, play upon each other like the blades of a pair of scissors, and crop the grass. Of the upper incisors, the foremost are the largest, and occasionally the premolars are strikingly large. In contrast to the other Marsupials the members of this family generally have well developed eyelashes. The tail of the Kangaroo is very thick and strong, so that the animal can use it as a fifth leg in standing upright or moving slowly. The hind legs are very strong, and the fore limbs are short, which enables them to progress and get over the ground, very swiftly and gracefully by a series of bounds.

Although very powerful animals, all species of Kangaroos are exceedingly timid, and in captivity have been known to die of sheer fright. In freedom, when alarmed by any unfamiliar sight, sound or smell, they will immediately raise upon their tail and hind limbs as upon a tripod. Mr. R. Ramsey Wright says that when resting, one male of the family will support himself on the tail and ankle bones, while the others lie about or browse at their ease, commonly applying their fore-feet to the ground till they receive a danger signal from their sentinel. Some species of Kangaroos are the size of a small rabbit, while others are as large as sheep, the head always being small compared to the rest of the body and tapering towards the muzzle. The fore-paws each have five digits armed with a strong curved claw. The hind foot is extremely long, narrow and without the first toe, consisting mainly of one very large and strong toe corresponding to the fourth of the human foot, and ending in a strong curved and pointed claw; close to the outer side of this lies a small fifth digit, and to the inner side, two exceptionally slender toes bound together almost to the extremity in a common integument.



GIANT KANGAROO.

The Common or Grey Kangaroo (Macropus gigantius) is the best known species. It is also the largest, an old male Grey Kangaroo when erect on his hind feet and tail often standing seven feet high, the females being about one-third shorter than the males. The color of this species is usually a dull yellowish brown, pale on the under parts and darker on the tail, but while the exact shade varies greatly in different individuals, generally the color has a distinctly greyish cast. This species is the most numerous as well as the most common of its genus, and is also known as the Boomer, Forester, and Old Man Kangaroo. Although their numbers have diminished considerably in the proximity of the towns, on the other hand they have increased on the sweet pasture of the newly settled districts, so that on the whole Kangaroos do not seem to have decreased much since they were discovered by Cook off the coast of New South Wales over a hundred and thirty years ago, although they have been steadily driven further inland by the persistent hunting of the colonists and natives.

"The natives generally hunt the Kangaroo by forming a circle around the herd and killing them with clubs. By the colonists they are generally driven toward a particular spot where the sportsmen have been stationed before hand after the fashion of a bateau, but they are also stalked, and occasionally hunted by dogs. In spite of their timidity Kangaroos are enemies not to be despised when brought to bay, and a blow from the powerful tail or hind legs is sufficient to cause serious injuries, and the dogs are often torn open by the strong claws of the hind feet."

Mr. W. H. Blundell, in a letter to "Nature," a number of years ago wrote:

"The great plains and deserts over which these marsupials wander in search of food afford an exceedingly precarious supply of pasture, in consequence of drought and bush fires, which not infrequently follow a super-abundance of herbage. These animals by means of their procumbent teeth, which they make use of as shears, are enabled to cut off any green root or half buried remains spared by a scorching sun. and obtain nourishment where any grass feeding placental animal would certainly starve. It is in consequence, I believe, of the power which is by this means given these animals, that in the great pastural districts in New South Wales and Queensland, it has been found that they are far more destructive of food than any stock that can be put upon the land. And in places where Wallabys and Paddy Melons, are exceedingly numerous, it is noticed that the native grasses in the particular localities which they frequent become completely destroyed, and that such places remain entirely ungrassed until fresh seed is scattered over them by the winds.

Brehm in describing the locomotion of Kangeroos says: "the fore limbs are tightly clasped against the chest and the tail stretched backwards, while the powerful thigh muscles are caused suddenly to straighten the joints, by which action the body flies through the air in a low curve. In ordinary locomotion the leaps are only nine or ten feet, but when alarmed the animal doubles or even trebles its exertion. The right foot seems to be employed more than the left and is held a little in front of it. With each leap the tail swings upward and downward, but it is not employed in changing the course of the animal, for this is always effected by two or three short leaps. The fore limbs are never lowered in locomotion, and in fact, only the toes of the hind limbs touch the ground. In open ground it is more than a match in speed for the swiftest dog, and can keep up its swiftest pace for hours. When there is any cover it has immeasurably the advantage by clearing clumps or shrubs six or eight feet high; on uneven ground, on the other hand, it is at a disadvantage, especially when going down hill, for it is liable to slip and roll over on reaching a sloping surface.''

Kangaroo flesh is said to be excellent eating, but the Giant Kangaroo is hunted principally for its skin which is largely used in the manufacture of shoes. Only the fur of the younger animals is dense enough to make the skins of value to the furriers.

The Red Kangaroo (Macropus-rufus) is next in size to the Giant Kangaroo, but, as its name indicates, the fur has a reddish hue, and as it is also coarse and woolly, it is not sought by furriers, the skin is also too harsh for leather.

The Blue Kangaroo (Macropus-erubescens) is still smaller than the Red species, but has a long soft fur, the under coat of which is pinkish or light blue in color. The pelt is soft and thin, and the skins very much appreciated by the tanners. The fur is also valued by the furriers.

The Walleroo (Macropus-robustus) is smaller than any of the foregoing, and is the scarcest of all Kangaroos. It is whitish grey in color, and the hair is so coarse and harsh that the skins are only suitable for the tanner's use.

The smallest members of the Kangaroo tribe are the gregarious **Kangaroo Rats** that live in colonies in connected burrows, and the tree-climbing **Musk Kangaroo**, whose body exhales a strong odor, and which feeds upon insects and worms. The Rat Kangaroos live in the grass and ''scrub,'' and according to Ingersoll, ''scratch the ground all day in search of the roots upon which they feed, and cause havoc in the potato patches of the frontiersmen.''

The so-called **Hare Kangaroos** (Lagorchetes), live on the open plains, and in size, color and habits resemble the common hare. They make ''forms'' in the grass, but are exceedingly fleet, so that at the first approach of danger they generally succeed in reaching the galleries, they have made in the ''scrub'' by cutting away the lower branches and spines, where it is almost impossible to reach them. Like the Kangaroo Rats, the Kangaroo Hares differ from the true Kangaroos in anatomical peculiarities as well as in their habits and appearance.

THE WALLABIES.

Of the Wallabies, or Rock Kangaroos, the **Yellow Wallaby** (Petrogale-xanthopus is the one oftenest seen in captivity. It is about two feet long, and has a tail as long as the body, and the narrow head and long ears that characterize all Kangaroos. The long dense fur is soft and fluffy, and the general color is yellowish, shading to a light brown on the back, and showing a black stripe down the center and white marks on each side. This species is not very numerous, and the skins that are marketed are shipped to London from Adelaide.

The Rock Wallaby, or Bush-tailed Kangaroo (Petrogale-pencillata), is more numerous, and has a two inch long reddish silvery fur very similar to that of the red Lynx; the hair on the back is grey speckled, rather longer than that on the belly which is brownish in hue. There is a black line between the eyes, and there are occasional white spots on the body. The fur is serviceable, and extensively used for making coats, capes and various other articles. This species inhabits New South Wales and Victoria, and the best skins are those shipped from Sydney.

All the species of the genus Petrogale, or Wallabies, have shorter toes and hind legs than the true Kangaroos of the genus Macropus; and the under surfaces of their feet are covered with horny tubercles to prevent them from slipping. They do not support the weight of their bodies on the tail, although they can use it to balance with.

The representatives of the genus Halmaturus, to which Bennett's Wallaby, or **Bush Kangaroo** (Halmaturus-bennetii), and the **Black or Swamp Wallaby** (Halmaturus-wallabutus), belong, do not live on open ground like the Macropus, but inhabit the swamps, and sections of country more or less thickly covered with brush and shrubs. The close lying hairs on the former species in short and grizzly, similar to the Raccoon in color but browner, and the skins are used by furriers as an imitation for raccoon, or made into leather by the tanners. The Swamp Wallaby is one of the largest representatives of its genus, being about three feet long, but the reddish brown fur is coarse and covered with long black hairs. It is strong and serviceable however, and the smaller skins are quite extensively used in the manufacture of coats but the large skins are made into leather.

Among the other species of this genus are the large **Antelope Kangaroo** (Halmaturus-antelopinus), of Northern Australia, and the small **Bridled Kangaroo, or Pedemelon** —Paddy Melon—(Halmaturus-thetidis), of New South Wales, the **Halmaturus-billardieri** that lives in herds in the interior of Tasmania; and the eighteen inch **Wood Wallaby** (Halmaturus-brachyurus), which spends most of its time in the trees, and whose grizzly brownish soft fur is well adapted for coat linings.

THE PHALANGER.

(Australian Opossum.)

The Phalangers are for the most part small in size and are divided into two classes, the common and the flying Phalangers; some of them are insect eaters, but most of them live on the young shoots, leaves and blossoms of the trees they inhabit. All the species of Phalangers have long prehensile tails, and six incisor teeth in the upper, and two in the lower jaw, with four molars on each side, but the small premolars vary in number.

The Vulpine Phalanger, (Trichosurus-vulpecula) commonly known as the **Australian Opossum**, is the most interesting of the many different species of Phalangers. It is found in nearly every part of Australia, and seems to be constantly increasing in numbers in spite of the fact that millions of the species are killed annually for the fur value of their skins. In the finest skins the under fur is a bluish grey, with longer and darker hairs on the back than on the belly, which is yellowish, and has very dense fine short hair. The largest representatives of this species are found in Tasmania, and sometimes measure twenty-five inches in length, exclusive of the eleven inch tail; it is yellower, and the fur is longer and thicker than that on the varieties found in other parts of Australia. The Victoria skins have a darker and richer blue-grey shade than any others except those of the so-called "Adelaide Opossum," which is the smallest of its species, and has a fur resembling that of the chinchilla in appearance. The "Melbourne Opossum" is the most numerous of all the Vulpine Phalangers. Its length is about sixteen inches from tip to tip. The dense one and a half inch long fur is usually bluish grey, mingled with larger and coarser dark hairs on the upper parts, and white beneath. Most of the "Australian Opossum" skins are worked

"AUSTRALIAN OPOSSUM."

up and sold in the natural color, but they take a brilliant dye, and the fur becomes soft and silky in the process.

Cook's Phalanger, generally called the **Ring-tail Opossum,** is a small animal only six inches long, with a tail twice the length of its body. The fine soft fur is a rich blue on the back, and a pure white on the belly; like the "Adelaide Opossum," it has very much the appearance of chinchilla, and is sometimes used for making small articles of fur wear.

The skin of the **Great Flying Phalanger** (Petaurus-australis), is too thin to allow of its being used for fur purposes, but mounted specimens of this animal are often seen in museums.

THE OPOSSUM.

Of all the Marsupials the Opossum approaches most closely to the typical mammal in the structure of its reproductive organs; and while fossils show that the different families of Australian Marsupials are of comparatively recent origin, the American Implacentals are represented amongst the earliest mammalian fossils.

Some of the family Didelphidae, which includes all the American Marsupials, are very small and few of them attain the size of a cat. They feed chiefly on insects, but will also eat small reptiles, birds and eggs. The Water Opossum (Chironectes) differs entirely in habits from the other species of the family, and has the webbed feet necessary for an aquatic existence. The other species, all belonging to the genus Didelphy, are arboreal and more or less nocturnal and while some are provided with a pouch, others are destitute of it.

The Virginian Opossum (Didelphys-virginiana) is one of the largest members of the family and has a well developed pouch, as have also the species found in Brazil. It has an elongated muzzle that makes its head appear large in proportion to the rest of its body although the brain cavity is small. The tail is scaly like a rat's, except at the root, and the black ears are naked, resembling a bat's wing. The feet, which are naked on the under surface, each have five toes, the inner toes of the hind feet being opposable.

The general color of the woolly fur is a yellowish grey or grizzly, caused by the white underwool showing through black or brownish top hairs.

Opossums lead solitary lives, except in the pairing season when they occupy nests of dried grass, in the hollows or roots of trees, which are shared by the young as soon as they are able to leave the pouch.

"The opossum brings forth a litter corresponding more or less nearly to the number of her teats. These are thirteen, disposed in a circle, six on each side and one in the middle.

"The developmental changes which take place within the body of the mother occupy from twenty-four to twenty-eight days. The young are then born in a perfectly helpless condition, and only about half an inch in length. They are immediately placed in the pouch by the mother, one being attached to each of the long teats. The mouth at this stage is well formed, and the fore limbs are sufficiently advanced for the claws to assist the young to cling to the teats, but the hind limbs are developed afterwards. After attachment, the corners of the mouth grow up around the teat, insuring a more perfect channel for the flow of the milk; this is further aided by a well-marked groove on the upper surface of the tongue. In five or six weeks the young opossums have attained the size of little mice, and in about two months have developed sufficiently to leave the pouch.

In the species of Opossums that are characterized by the absence of the pouch, the young are born practically in the same condition, but they are carried on the back of the mother after they are old enough to leave the teats, being securely held there by means of their prehensile tails, which are twined around the tail of the mother.

The color variation in Opossums is largely due to age, the half grown animals looking blackish at a little distance while the old ones have a whitish appearance. The skins are worked up either in their natural color, or dyed and sold as Black Marten or skunk opossum.

THE KOALA.

(Native Bear.)

While not as important commercially as the Common Phalanger, the skins of the Koala are used extensively in the manufacture of sleeping bags, coats and other articles where a durable, reasonable priced fur is desired. The scientific designation of this animal signifies Ashy Pouched Bear, which is a very good description of it. The Koala is strictly arboreal, the natives often being obliged to follow it to the top of the highest trees sixty and seventy feet above the ground.

KOALA.

The Koala is the largest Australian mammal living in the trees and that is probably the reason why it is called the bear by the natives, as it is unlike that animal in its nocturnal habits as well as its slow movements, in both of which characteristics it resembles the sloth.

It is from eighteen to twenty-four inches long, and the general color is a light grey, the tips of the coarse hair being white. The upper part of the belly and chest and the insides of the legs are white, and the lower part of the belly is reddish brown, at times approaching to a dark purple hue. The fur on the hind quarters is much shorter than on the rest of the body, and has patches and spots of white. The ears are very short, tufted on the inside with long white hairs. The head, which is broad and short, is surrounded with a fringe of hair. The nose is bare, and whiskers are absent. The formation of the feet is singular, the claws of the fore-paws being five in number, the two inner ones opposable to the toes like the thumb of a man to the fingers of the hand. The next two toes are small and joined together, and the fourth, which is the longest, is separate, as is also the fifth which however is somewhat shorter.

THE WOMBAT.

The Phascolomyidae is a family of Marsupials represented by a single genus, the Wombat, sometimes called the Australian Badger. There are three species of this animal—Phascolomys-platyrhinus, Phascolomys-latifrons and Phascolomys-wombat. The latter is the most common. It is a clumsy animal, but in spite of its shuffling gait is able to cover considerable ground, as it is patient and persistent. It is easily caught alive, and in captivity is indifferent to its keeper's appearance and cares for nothing but its food. It is difficult to arouse Wombats from their ordinary condition of good natured indifference, but when excited they are able to take care of themselves with their chisel-like teeth.

The Common Wombat is about two feet long, has a rudimentary tail, short thick neck, and a large head. The short stout legs are adapted for burrowing by the stout curved claws with which the toes, with the exception of the innermost toe on each hind foot, are armed. It lives chiefly on roots which it gnaws after the fashion of the rodents. It has two chisel-like incisor teeth in the upper and two in the lower jaw, which like the beaver's are separated by a gap from the molars. Of the five rootless molars in each jaw, the foremost of each series is a premolar of only half the size of the true molars.

The short fur is soft and dense, and of the general whitish grey color characteristic of most of the Australian mammals. It is used extensively in the manufacture of cheap, serviceable fur coats, sleeping bags and robes.

The Bandicoots are small animals that show the same disproportionate development of the hind legs which characterizes all the species of Kangaroos, but instead of progressing by a series of bounds like the latter their gait is a combination of running and leaping similar to that of the hares; they are distinguished by having the opening of the pouch turned backward instead of forward, as is the case with all other Marsupials.

The Bandicoots live in the cooler and more mountainous regions of Australia, and form burrows in their search for roots and tubers often proving a nuisance to settlers by ravaging potato fields and burrowing under the walls of barns to get at the grain. There are two genera of Bandicoots—the Perameles, resembling the rat in form and the sparsely haired character of the tail, which is represented by a half dozen or more species on the continent of Australia, and the Choeropus-castanotis, or Pig-footed Bandicoot, found only in South Australia. They agree in general habits, but the Choeropus, instead of living in burrows, make nests for themselves in the thick underbrush where they easily escape notice. Their fur is longer than that on the Perameles, and they have slenderer legs and only two toes—the second and third—on the fore feet, and only one on the hind feet—the fourth—which bears the weight of the body; the second and third joined toes, and the fifth are present and bear nails, but are quite rudimentary. All the species of the Perameles bear the weight of the body on the fourth and fifth toes of the hind feet, and have five toes on the fore feet, the two inner ones being rudimentary and nailless.

The skins of the Bandicoot are of little value either for fur or leather purposes.

The Dasyuridae Family includes both Carnivorous and Insectivorous types, differing from the other Marsupials in the character of their dentition and in having the second and third toes of the hind feet perfectly free from each other. The Dasyuridae is rich in Genera and Species, ranging from mouse-like insect eaters to the Carnivorous **Spotted Cat of Australia** (Dasyurus-maugoei) and the **Tasmanian Devil** (Dasyurus-ursinus) resembling the Badger in the form of body and large head, while the texture of its deep black fur is more like that of the bear. Some of the smaller species possess a small inner toe on the hind foot which is wanting in the type variety.

THE MONOTREMATA.

The Monotremata are an order of Australian Mammals whose young are hatched from eggs laid by the female, and they are known as egg-laying mammals because the young when hatched are suckled by the mother.

The Platybus (Ornithorhynchus-anatinus), or as it is sometimes called the Duck Bill, because of the bill which forms the extremity of its head, has a mole-like brownish black under fur that excells that of the seal in richness. The color of the water hairs that protect the under fur are a silvery brown on top and lighter on the belly, giving the animal a beautiful appearance when in full pelage.

The Platybus is a small animal, from eighteen to twenty inches long from tip to tip; in structure it somewhat resembles the reptiles, and like all water animals has a thick pelt and no external ears. It has no teeth. The eyes are small, and the bill is perforated with two holes for nostrils. The limbs are short, and each foot has five complete toes furnished with strong nails. The fore feet are webbed considerably beyond the extremity of the nails, but on the hind feet the web reaches only to the base of the nails. The nails of the fore feet are somewhat flattened and expanded, but those on the hind feet are longer, narrow and curved. The heel of the Platybus is furnished with a spur like that of the gamecock but not so long.

The Platybus lives in burrows from twenty to forty feet deep, with one entrance to its nest from the land and another from the water. The young are born hairless and blind and totally unlike the full grown animal, having short fleshy lips with which to obtain the milk from the mammae of the parent. While possessing marsupial bones similar to those of the Pouched Mammals the female Platybus has no pouch.

Dehaired and dyed, the fur of the Platybus is much finer than that of the seal, and well adapted for the manufacture of caps and other small articles or trimming ornaments, but comparatively few skins reach the fur markets of the world.

The Echidna (Echidna-hystrix) is an ant eater that has a much more extensive distribution than the Platybus, from which it differs in structure as well as appearance; instead of a mole-like fur, the upper part of the head and body are covered with a mixture of stiff hairs, and short thick spines that have caused it to be called the Australian Porcupine. Although in some localities the underwool of the Echidna is abundant, its skin is of little value for any purpose, and it is only mentioned here because of its peculiarities. It has a long bill but no teeth, and feeds solely on ants which it obtains by means of its long tongue, which like the palate is beset with spines. The eyes are of fair size, but it has no ears, and the tail is a mere stump. The body is broad and depressed, and the line of division between the spine covered back and the hairy under parts is sharply drawn. The short strong limbs are armed with very powerful claws, varying in number in the different species from three to five on each foot.

Echidnas are fossorial and in the main nocturnal animals, inhabiting rocky districts in the mountains at an elevation of three thousand feet and upwards. Little is known of their breeding habits, but according to the natives they lay eggs, and the young, two in number, are born during the Australian winter, usually in May.

WHITE THIGHED COLOBUS.
MARMOSET.

CHIMPANZEE.

ABYSSINIAN MONKEY.
LEMUR.

THE PRIMATES.

Linnaeus included Man and the Bat, as well as the Monkeys and Lemurs, in the order of Primates; but now the Bats are placed in a separate order—Chioptera, and Man is referred to as belonging to the Bimana, while the Monkeys and Lemurs are usually spoken of as Quadrumana; although strictly speaking the Bimana and Quadrumana, the latter so called because of their ability to use both front and hind feet as hands, are simply subdivisions of the order of Primates, which is therefore naturally considered the first and highest order of the sub-kingdom Vertebrata.

Cuvier, writing of the Quadrumana in his "Animal Kingdom," says: "Independently from the anatomical details which distinguish it from Man, this family differs from our species in a remarkable way. All the animals belonging to it have the toes of the hind feet free and opposable to the others, and the toes on all are as long and flexible as fingers. In consequence of this the whole species climb trees with the greatest facility, while it is only with pain and difficulty they can stand and walk upright, their foot resting on its outer edge only and their narrow pelvis being unfavorable to an equilibrium. They differ from Man by having a much more elongated muzzle and a tail, and a gait more like that of other quadrupeds. Notwithstanding this, the freedom of their arms and the complication of their hands allow them all to perform many of the actions of man as well as to imitate his gestures."

Everybody knows what an Ape or Monkey is, but comparatively few can tell how to distinguish the Apes from the true Monkeys and the Baboons or Dog-faced Monkeys, or what constitutes the line of demarkation between these two groups and the Lemurs, which are closely related to them but have so many different characteristics that they are placed in a separate family (Lemuridae); while the Apes are classified as Simiidae and all the Old World Baboons and Monkeys are grouped together in the family Ceropithecidae, and all the American Monkeys, except the

Marmosets, which belong to the family Halpalidae, are included in the family Cebidae.

Because of structural differences and peculiarities of coloration and appearance, there are numerous genera with a variety of species in each family of the Quadrumana, but only a few of them are entitled to consideration as fur-bearing animals. Monkeys are most abundant in the tropical parts of South America and Africa, although they are fairly numerous in the warmer portions of Asia, and some specimens are found as far north as the snow line. The only species in Europe is the Barbary Maccaque (Macacus-inuus). Nearly all the leading species of Monkeys have specific common names as well as different technical scientific designations.

The Monkeys all have four straight incisors in each jaw, and with a single exception flat nails on all the extremities, two characters which approximate them more nearly to Man than the Lemurs; their molars are blunt tubercles like ours, and their food consists chiefly of fruit. Their canine teeth being longer than the rest supply a weapon which we do not possess, and require a hollow in the opposite jaw to receive them when the mouth is closed.

The Monkeys of the Eastern Continent all have the same number of grinders as Man; but the Marmosets are the only Monkeys of the New World of which this can be said, all the representatives of the Cebidae having eight bicuspeds instead of four. None of the American Monkeys have cheek pouches, and they can always be distinguished by the absence of the deep callosities which are found on the buttocks of all the Old World species except the Apes, with which they could never be confounded because of their small size. The American Monkeys are purely arboreal, passing all of their time in the tree tops, swinging from branch to branch, and rarely if ever descending to the ground. They have all their digits provided with well developed nails, but those who have thumbs cannot oppose that digit to the other digits of the hand as the representatives of the foreign species do.

For a long time zoologists classed all the Old World Monkeys as belonging to one family (Catarhini) because of the very thin partition between their nostrils, while they grouped all the broad-nosed monkeys of the Western.

Continent in the family (Platyrhini) on account of the greater width of the vertical partition between the two nostrils. This classification has been generally abandoned for the one that divides the Monkeys of the Old World into the Simiidae and Ceropithecidae families, and places the Marmosets with their thirty-two teeth, clawed toes, and nonprehensile tails, in the family Halpalidae, and all the other South American species with prehensile tails and thirty-six teeth, in the family Cebidae.

The Baboons differ from the rest of the Quadrumana in disposition as well as appearance, having fierce tempers and a bull dog courage, combined with strength and agility that enables them to meet their most powerful enemies upon something like equal terms; and it is said that even in captivity they must at all times be treated as dangerous animals. The Mandrill (Cynocephalus-mormon) of West Africa, with its long shaggy hair, lion like appearance, and the peculiar markings on its face which accentuate the grimaces which it is constantly making, is the most interesting and wonderful of the Baboons. It is easily the largest, most formidable, ferocious and hideous of its kind, and fully justifies Dr. Hornaday's statement that "It seems like an animal not of this earth, but reminds one of the great beasts of the vision of St. John the Divine." The Hamadryas Baboon, with long side whiskers and a cape of long hair, is the handsomest representative of the Dog-faced Monkeys, while the Golden Baboon has the liveliest disposition, is the best tempered.

Of all the Quadrumana, the **Gorilla** (Gorilla-savagei), resembles Man the closest in walk and in structural formation, but the Orang Utang(Simia)and the Chimpanzees (Athropopithecus-niger and -calvus) approximate the nearest to the Hominidae in intelligence and susceptibility to training, both being mentally superior to the Gorilla and the long-armed Gibbons (Hylobartes-lar); but as none of the Apes are fur-bearing animals, our present interest lies with some of the representatives of the Ceropithecidae rather than any of the members of the Simiidae family.

Generally speaking, the Black Monkey of commerce is the skin of the **White Thighed Colobus** (Colobus-vellorosus) while is very abundant on the west coast of Africa.

This species is from one to two feet long exclusive of the tail which will measure fully two feet. The long black silky hair on the back is from two to four inches long, and in some cases is divided by a natural part in the center. In some localities the hair is coarse and harsh and the skins consequently are of less value. The tail of this animal is white and slightly tufted, and the beard, cheeks and the long fringe around the black face are also pure white and there is a white spot on the chest. The legs and feet are black, but the sparse short hair on the thighs and rump is of a greyish white color. The skins of the Ursini Colobus (Colobus-ursinius), from Sierra Lerone, are also sold as Black Monkeys, but they are smaller and harsher and only a small quantity are marketed.

The Abyssinian Monkey (Colobus-guereza), whose home is in the mountains of East Central Africa, is one of the largest and the most beautiful of all the true Monkeys. The skins measure from two to two and one-half feet, exclusive of the four-foot tail; the long silky white hair is marked with a black saddle on the back, and the thick bushy black tail has a beautiful long white tuft on the end. The legs are all black, but the black face is surrounded by a white fringe. The skins are highly prized but they are very rare.

The skins of the Grey Monkey of the west coast of Africa, also known as the **Diana Monkey** (Ceropithecus diana), are much more common in the fur markets than those of the Abyssinian Monkey. It is almost eighteen inches long with a black tail twice the length of the body. The color of the back is a bright chestnut brown, the sides are grizzly, and the cheeks, chest and belly, white. A white beard, and a white line on the forehead, as well as one on the thighs separating the black extremities from the brown and silvery body, help to give a striking appearance to this animal.

The fur of the **Blue Monkey or Mountain Entellus** of the Himalayas (Semnopithicus-schistanus), is highly esteemed. The hair is three inches long, dense and silky, and varies in color from a bluish grey in some specimens to a dark grey in others; the belly being lighter in color than the back and almost bare. There is a white tuft on the two-foot tail, and a crest of black fur between the eyes. The length of the body of this animal is from two to three feet.

There are a number of other African Monkeys that are hunted more or less for their skins, but none of them are of much importance commercially, the skins of the various species all being sold under the comprehensive name of "**Common Monkey,**" which is made to include: Campbell's Monkey (Ceropithecus-campbelli), the Mona Monkey (Ceropithecus-mona), the Green Monkey (Ceropithecus-callithricus), the Grivet Monkey (Ceropithecus-griseoviridis), the Malbrouck Monkey (Ceropithecus-cynosurus), the Patas Monkey (Ceropithecus-patas), the Vervet (Ceropithecus-lalandi), the Moustache Monkey (Ceropithecus-cephus), the Red Monkey (Ceropithecus-erythrogasta), the Pluto Monkey (Ceropithecus-pluto), the Blue Monkey (Cerocebus-fuliginosis), the Wanderoo Monkey (Macacus-silenus), the China Grey Monkey (Macacus-tchelicusis), and a number of others.

The Marmosets of South America, also known as Ouistitis and Tamarins, are the smallest of the Monkey tribe; and in fact are more like squirrels than Monkeys in size as well as habits, climbing in the same way and subsisting not only on fruits, but also to a large extent on insects. The Marmosets measure from several inches to one foot in length, and have a short thick silky or woolly fur, which lengthens in some species into ear tufts and in others into a kind of mane. These little animals are extremely variable in coloration, and are very sensitive to cold; they are of a low order of intelligence but make amusing pets when kept in confinement. There are many different varieties or species in the two genera into which they are divided to distinguish those whose lower canine teeth are longer than the front teeth from the others; but they all have long prehensile tails, and toes that with the exception of the great toe are furnished with pointed claws instead of the more or less flattened nails that characterize other Monkeys; the differences in appearance are occasioned principally by the length of the fur and the variety in coloration.

The best known American Monkeys are some of the species of the **Woolly Monkey** (genus Lagothrix), the **Spider Monkeys** of the genera Eriodes and Ateles; and the **Sapajous or Capauchin Monkeys** of the genus Cebus, which are the typical long prehensile tailed representatives of the family Cebidae and the variety commonly seen in the menageries. The non-prehensile tailed members of this family are the **Owl-faced Monkeys** of the genus Nycthitithecus, the **Squirrel Monkey** of the genus Chrysothrix, the **Brazilian Titi Monkey** of the genus Callithrix, the **Saki Monkey** of the genus Pithecia, the **Ukari Monkey** of the genus Uacaria, and the **Howling Monkeys** of the genus Mycetes.

THE LEMURS.

The Lemurs, according to Linnaeus, comprehend all the Primates that have in either jaw incisors different in number from four, or at least differently directed than those of the Monkeys; this negative characterization could not fail to embrace very different beings, while it did not even include those which should be combined. Geoffroy has established several divisions of this genus which are much better characterized. The fore-thumbs of these animals are well developed and opposable, and the first hind finger is armed with a pointed raised nail, all the other nails being flat. Their fur is wooly, and their teeth exhibit sharp tubercles catching in each other as in the Insectivora. They are very active animals, and from their pointed heads have sometimes been called **Fox-nosed Monkeys.** Their food is fruit. Their species are very numerous, but they are only met with in the Island of Madagascar where no Monkeys are found. Nearly all the difference that exists between the different species of Lemurs is in the color. Their skins are of little value.

The Black Lemur (Lemur-macaco) is a handsome animal about twenty inches long, which inhabits the dense inland forests on the Island of Madagascar. The head and back are covered with a thick jet black fur about one inch long, but on the chest the thin fur is brown with a patch of white in the center.

The Black and White, or **Ruffled Lemur** (Lemur-albifrons), is really a variety of the Black Lemur and is found in the same habitat. It has the same narrow head, short tail, long legs, and fingers furnished with spongy pads. The back and lower half of the body are light brown, almost white, but the hind legs and arms are a dark brown.

The Red-Fronted Lemur (Lemur-rubifrons); **the Ring-Tailed Lemur** (Lemur-catta), and **the Grey or Brown Mouse Lemur** (Cherogalens-nutri), are all smaller than the Black and the Ruffled Lemurs, the general color of each being various shades of grey, with the distinctive markings that the different names indicate.

The Woolly or Dwarf Lemur (Microcebus-senithir), the smallest of the Lemurs, is of a brown grey color and only six inches in length.

DRILL (DOG-FACED MONKEY).

We have devoted so much space to the Quadrumana on account of the general interest felt in these animals because of theories advanced by Darwin and other scientists in regard to their relationship to man, rather than because of their value as fur-bearing animals.

The **Aye Aye** (Chiromys-madagascariensis), the only representative of the family **Chiromyidae**, is the last of the lemur-like animals, but it has teeth so different from the Primates that it must be considered as belonging to the Rodentia. This animal measures about three feet from tip to tip, most of the length being in the bushy tail. The claw corresponding to our middle finger is of great length and slenderness, and is probably used to extract from their burrows the larvae which is the principal article of its diet. The Aye Aye is dark brown in color on top, reddish on the under parts, and greyish yellow on the throat. It is nocturnal, builds its nest in the upper branches of trees, and gives birth to but one young at a time. The natives of Madagascar have a superstitious fear of the creature, and it is therefore hard to obtain, although it is inoffensive and easily tamed.

The Tarsier (Tarsius-spectrum) is another animal that in many respects resembles the Lemurs, but is so different in others that it is placed in a separate family—**the Tarsiidae.** It is arboreal and nocturnal in habit, about the size of a small rat, and covered with a soft thick fur; the general color is a dark fawn, with a reddish face and forehead, and dark rings around the eyes. The tarsal bones of the hind limbs are unusually long and the hand is also noticeable for its length and the curious claws with which it is provided. It has thirty-four teeth—four more than the Indri, and two more than the true Lemur. It feeds on insects and small reptiles. never eating fruit. Its habitat is in the Malayan Islands, where it is looked upon with dread by the natives.

THE BEAVER (Castoridae)

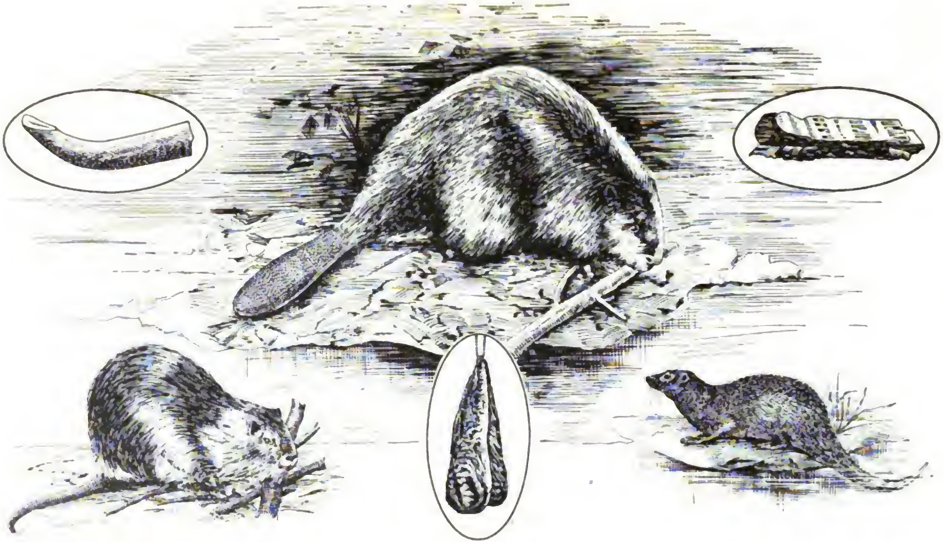
The Beaver is the most interesting of all fur bearing animals. It possesses almost human intelligence, and its instinct is often better than human judgment. It works with marvelous ingenuity, and illimitable patience in the construction of its lodges and dams; and will attack the trunk of a tree, without any regard to its size, and fell it by gnawing through the wood with its chisel-like teeth.

According to Cuvier, "The Beavers choose waters of sufficient depth not to be frozen to the bottom; and, as far as possible, running streams, in order that the wood that they cut above, may be carried down by the current to the spot where it is to be used. They keep the water at an equal height, by dams; composed of all sorts of branches, mixed with clay and stones, the strength of which is ever increased, and which finally, by a process of vegetation, become converted into hedges. Each hut serves for two or three families, and consists of two stories. The upper story is dry, for the residence of the animals; and the lower is under water, for the storage of their bark, etc. The lower story alone is open, and the entrance is under water, having no connection with the land. The huts are a kind of rude wicker-work, being made of interwoven branches and twigs, plastered with mud. There are always several burrows along the bank, in which they seek shelter when their huts are attacked. They only reside in these habitations in winter, in the summer they separate, and live singly in holes in the bank. They are usually caught in traps, but they are sometimes taken in nets; or their houses are broken into, and when the animals take refuge in the water, they give the alarm to their companions by striking the surface of the water with their tail. Beavers have been known to cause the waters of a lake to rise by building a dam across the outlet; and the soil, in many sections, has been enriched by the alluvial deposits, resulting from the dams which have been constructed by beavers to collect the water, that but for their efforts, would have been carried off in many small streams."

Kingsley claims that many of the tales that have been told about this animal are fanciful exaggerations. He says, "No beaver could learn the trick of felling the tree to fall in a given direction. What it has found out, is, that by biting a tree long enough, and hard enough, it can bring down within reach the twigs it wants to eat. The appearance of a stump left by a beaver is different from that left by a woodsman, who causes the tree to fall in the required direction by cutting one side lower than the other. The tree felled by the beaver is gnawed all around its circumference, so that an hour-glass shape results, with a constantly contracting center, until the tree falls to whatever side it is inclined, the trunk as well as the end of the stump being conical." Those who have seen trunks of trees floating in the streams, where the beavers have operated, know that the stories told about its sagacity in only cutting the trees that can be used in the construction of its homes and dams are products of the imagination; but on the other hand, it is certainly something more than a coincidence, that the trees felled by the beavers never fall in the direction of their lodges; something certainly teaches them to bite harder on the side where a deeper cut will cause the tree to fall in the direction that will save the work, upon which they have expended so much time and skill, from destruction.

Beavers work only at night, and their food is of a vegetable nature. They thrive in captivity, and can be tamed and made to eat bread and cabbage, or flesh. Dr. Richardson says: "The Beaver attains its full size in about three years, but breeds before that time. According to Indian report, it pairs in February, and after carrying its young about three months, brings forth from four to eight or nine cubs, toward the middle or end of May." Hearne states the usual number of young produced by the Beaver at a time to be from two to five, and that he only saw six, in two instances, although he had witnessed the capture of some hundreds in a gravid state. In the pairing season, the call of the Beaver is a kind of groan; but the voice of the cubs, which are very playful, resembles the cry of an infant.

The Beaver is a large animal, weighing from forty-five to sixty pounds; and measuring from two to three feet in



BEAVER'S INCISOR TOOTH
COYPU RAT (NUTRIA)

BEAVER
CASTOREUM

CHIP MADE BY BEAVER
BEAVER RAT

length, exclusive of the tail, which is about ten inches long. Its life is completely aquatic, both the feet and tail aiding it in swimming, and its ears are nearly hidden in the fur. The color of the fur of the Beaver varies from a light to a dark chestnut brown, in some cases being almost white, and in others almost black. The greyish under fur, which is about two-thirds of an inch deep, and protected by stiff water hairs from two to three inches long, is shorter and denser on the under part of the body than on the top, forming a pelage that is the perfection of water-proof covering.

The Beavers are distinguished from other Rodentia by the horizontally flattened tail, which is nearly oval in form and covered with scales. Beavers have five toes on each foot, those of the hinder ones being connected by a membrane; and the next toe to the thumb, on the hind feet, has a double and oblique nail. The four grinders, with their flat crowns, appear as if formed of a bony ribbon, reflected on itself, so as to show only one sloping edge on the upper row at the internal border, and three at the external one; in the lower row it is exactly the reverse. As their chief food is hard bark and other hard vegetable substances, their incisors are very powerful, and as they are worn away at the points, grow again rapidly from the roots. It is with these teeth that they cut down trees of every size and description.

Before the advance of civilization had restricted its habitat, and reduced its numerical strength, there were millions of Beavers on this continent where there are thousands today. They not only furnished man with covering for his body, and food for his nourishment, but they were the principal source of his wealth; but instead of working for the conservation of this important contributor to his comfort and prosperity, man has used so little judgment in hunting the Beaver that it is almost exterminated.

The Beaver, at one time, inhabited the greater part of North America, and some are still found in New York and Maine; but every year they are getting scarcer in the country east of the Missouri River, and north of the Rio Grande. Their range, which at one time extended farther north than that of most other fur bearing animals, is being constantly cut down; and even in Alaska, where the animals were once numerous, they have greatly decreased in numbers. The Beavers inhabiting Oregon, and the Rocky Mountains, are of a very light color, almost white; those found in the Southern States, Mexico and Arizona, are poor in quality, being heavy in pelt, and pale in color. The skins most valued, are those with a dark reddish brown hue found in the Hudson Bay country, in the Fort York district, and along the Moose River.

Beavers are also found in Europe, where they burrow along the banks of the Rhone, the Danube, the Weiser and other rivers. Scientists are somewhat divided in opinion because of the difference in their habits as to whether the European beavers belong to a distinct species, or are prevented by the closer vicinage of man, from building their houses like the American Beaver.

At one time most of the Beaver skins were sold to the manufacturers of silk hats, commonly called "beavers"; who first washed the skins to remove the grease, then removed the long top hairs; after which the under fur was cut off the pelt by machinery, and blown to remove the coarser hairs, before it was worked on the nap of the hat and dyed. Today the majority of skins taken go to the furriers, who use most of them, with the long top or water hairs removed, for making muffs and neck pieces for women; cuffs, coat facings and gloves for men; and for trimmings. Some skins are dyed black or seal brown, either with or without the long water hairs. The dark skins are sometimes made to imitate the sea otter fur by being pointed with white hairs.

Skin for skin, there are other furs that will bring more dollars than the Beaver; but none that are so well known in commerce, or that have such a staple value. In the early days of the fur trade on this continent, the beaver skin was the basis by which not only the value of other skins, but of all other commodities, was determined. A beaver skin was worth so many muskrats, and it took so many beavers to buy a sable or an otter skin. People paid their bills with Beaver skins and estimated the value of their possessions, by the number of Beavers they represented. To illustrate the way trades were made at this time, we reproduce here a schedule showing the value, in beaver skins, of some of the various articles traded to the Indians, by the Hudson's Bay Company in 1670; other skins being taken upon the basis of their relative value to the Beaver.

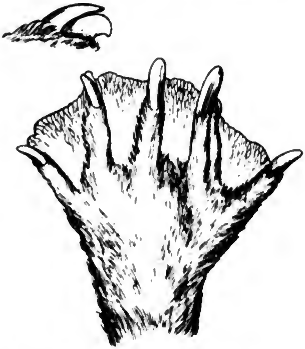
Guns	Twelve winter beaver skins for the largest
Guns	Ten winter beaver skins for the smallest
Powder	One Beaver for ½ lb.
Shot	One Beaver for 4 lbs.
Hatchets	One Beaver for a great and little one.
Knives	One Beaver for 8 great knives and 8 jack knives.
Beads	One Beaver for ½ lb. of beads.
Laced Coats	Six Beavers for one
Plain Coats	Five Beavers for one plain red coat.
Coats for women, laced, 2 yards	Six Beavers.
Coats for women, plain	Five Beavers.
Tobacco	One Beaver for one pound.
Powder-horn	One Beaver for a large powder horn and two small ones.
Kettles	One Beaver Skin for a 1 lb. kettle.
Looking glass and comb	Two Beaver Skins.

It is said, that in the early days, the fur traders in remote regions where they had no competition would stand a gun on end on the floor, and hold it in that position, while the Indians laid one Beaver on top of the other, until the pile received in exchange for the weapon was as high as the length of the gun, but we can find no one to vouch for the truth of this statement.

The Beaver is not prized alone for its skin value. The castorium, a secretion resembling sealing wax, found in two glands situated in the hinder part of the body of both the male and female of this species, also has a commercial value; thousands of pounds being sold annually. The flesh of the animal is good eating; the tail of the Beaver being considered the greatest delicacy on the board at the banquets of the old fur-trading companies.

Mention has been made of the double claw on the hind foot of the Beaver. The simply statement unexplained is misleading, as it naturally suggests to the mind a split claw, or two similar claws one above the other. By referring to the accompanying cuts the reader will see, that while the upper claw on the next to the last toe on the hind foot is smaller, it is otherwise like the claws on the other toes. The claw beneath it and which it protects is a thin blade, shaped at the end like the point of a pruning knife or scalpel. There have been many theories advanced as to the use that the beaver makes of this blade-like claw. It is too thin to be employed in cutting or digging; and the writer is inclined to agree with the trappers and woodsmen, who say that this extra claw is given to the Beaver to remove the splinters that get between its teeth when cutting down trees. The shape of this knife-blade claw and its location would seem to prove that it is indeed "the Beaver's toothpick."

It is strange that such an important structural peculiarity should have been overlooked, or ignored, by nearly all the scientists, and others, who have written about this wonderfully intelligent and interesting animal. The few who have noticed it at all, merely say, "The Beaver has a double claw on the next to the last toe on the hind foot."



THE BEAVER'S TOOTHPICK

THE CHINCHILLA.

The Chinchilla is the most valuable and beautiful of all the rodentia. It is found only in a limited area in South America, where it lives in burrows among the loose rocks, coming out to feed in the early morning, and towards sunset. The Chinchillas often travel considerable distances in search of their food, which consists entirely of roots and grasses and other vegetable matter, for which their strong, sharp incisors are well adapted. When eating they sit on their haunches, holding their food in their fore paws. They are very prolific, the female producing five or six young twice a year. The skin is light and thin, and the animal, which somewhat resembles the rabbit in the formation of its head and its long, broad ears, will measure from six to twelve inches in length, exclusive of the long bushy tail. It is covered with a dense, soft, lustrous, silky fur, nearly an inch long on the back of the finest skins, which come from the mountainous districts near Arica. On the sides the fur is somewhat longer and thinner. The color is a delicate French grey, darkly mottled on the surface, with a bluish slate tint beneath.

The skins incorrectly named and known to the trade as "Bastard Chinchillas" (Chinchilla-lanigera), come from the La Plata Valley, and owing to the lower altitude and warmer climate of their habitat, are smaller than the "Arica" skins, and have a shorter and less beautiful fur, that is darker underneath and not so clear one top. This species is more abundant than any of the others.

The Peruvian, Bolivian and Chilian Chinchillas, which have shorter ears and tails than the other species; all belong to the same genus and species (Chinchilla-brevicaudata), but the skins of the Chilian Chinchillas are larger and not quite so choice as those of the other two varieties. The Chinchillone (Largotis-cuvieri), whose principal habitat is in the Argentine Republic, but which ranges as far south as Patagonia, is larger than any of the foregoing species, and by some is supposed to be a cross between the rabbit and the chinchilla. The Largotis is yellower and dingier than the other Chinchillas, and the fur, while long and fine, is rather ragged.

The fur of the Chinchilla was prized by the ancient Peruvians, who made coverings and other articles out of it. It has always been in favor, but at present the price is so high for fine skins, and even those of inferior grades, that Chinchilla furs are not seen as much as they were a quarter of a century ago when "Bastard" Chinchillas sold for from ten dollars to twenty dollars per dozen; and the finest of "real" Chinchillas, as the (Chinchilla-brevicaudata) were called, could be bought for thirteen dollars each; and three dollars was a high price for a fair "Chinchillone." Now the prices are fifty to eighty dollars and upwards per dozen for the "Bastards," seven to fifteen dollars each for Chinchillones, and from fifty dollars upwards for real Chinchillas, extra fine skins bringing as high as one hundred and fifty dollars each. This makes the fur of the Chinchilla, when the size of its working surface is considered, as expensive as that of the Russian Sable, with which it cannot compare in durability. The leather is too light to be worked into fitted coats, but for loose wraps, neck pieces, muffs and trimming, Chinchilla can be used to advantage, and makes up beautifully.

CHINCHILLA

The Viscacha (Largostomus-trichodactylus) bears the same relation to the Chinchilla that the Marmot does to the Squirrel. It is a stout animal about two feet long with a ten inch bushy tufted tail. Its burrows dot the grounds of the pampas of Argentina, where these animals live in villages of about fifteen burrows, each containing about twenty members. In color the Viscacha is grey on the back, mottled with darker shades, and a yellowish white on the under parts. It has strong gnawing teeth and lives on roots.

THE RODENTIA.

· The Rodentia is the largest order of the Mammalia in the number of species and individuals, and also the most widely distributed. Most of the rodents are land animals, and a large proportion of them live in colonies in subterranean burrows of their own construction; some, however, like the Beaver, Water Vole, Nutria and Muskrat, are more or less aquatic, and others like the Squirrels lead arboreal lives. In speaking of distinguishing characteristics, Lydecker says:

"The Rodents are some of the most easily defined of all mammals and are best characterized by the number and nature of their teeth—especially those in the front of the jaws. They are distinguished by the presence in each jaw of a pair of large chisel-like front or incisor teeth, which grow continuously throughout the life of their owners. As a rule, no other incisor teeth, save these two pairs, are developed, but in the hares and rabbits and their allies a second smaller pair occur behind those of the upper jaw. There are no tusks or canine teeth in either jaw, and in the cheek-series the number of premolars is always reduced below the normal four, very generally only one of these teeth being present, while in some cases even this may be wanting. In consequence of the reduced number of incisor teeth, coupled with the absence of canines and the reduction in the premolars, the skull of a Rodent is always distinguished by the presence of a long gap between the front and the cheek-teeth. Indeed, the presence in all Rodents of only a single pair of chisel-shaped and permanently-growing lower incisors, opposed to a corresponding pair in the upper jaw, the total absence of canines, the long gap between the incisors and the cheek-teeth, and the reduction in the number of the premolars, are of themselves sufficient to distinguish the Rodent order from all other mammals, with the exception of the aye-aye among the lemurs.

"Among other distinctive characteristics of the group, the following may be mentioned. The feet are usually furnished with five toes, which generally terminate in sharp claws, although they sometimes have broad nails. Either the whole or the greater part of the sole of the foot is applied to the ground in walking, so that these animals may be described as entirely or partially plantigrade. Their skulls are characterized by the condyle of the lower jaw being elongated from front to back instead of from side to side, and thus permitting of that backwards-and-forwards motion of the lower upon the upper jaw, which is so noticeable when we watch a rabbit feeding; this character serving to distinguish Rodents alike from Ungulates and from Carnivores.

"The Rodents present a peculiarity in the structure of the mouth, which is quite unknown in any other mammals. In examining the mouth of any one of these animals—say a rabbit—it will be found that behind the upper front teeth the outer hairy skin of the face is continued inwards into the sides of the mouth, which by this means is divided into two distinct chambers, communicating with one another through a comparatively narrow orifice; the first chamber containing only the front teeth, while the cheek teeth are included in the second chamber. It appears that this arrangement is designed to prevent the entrance of extraneous substances into the true cavity of the mouth when the creatures are engaged in their characteristic operation of gnawing. In addition to this peculiarity, the whole of the inside of the cheeks in the hares and rabbits is covered with hair; while the pouched rats and hamsters have large pouches inside the cheeks, which are also lined with hairy skin. On the other hand, the gophers have pouches in the cheeks which open externally instead of internally.

"Rodents are almost entirely herbivorous in their habits; and they all of them obtain their food by gnawing. The hares are among the fleetest runners of all mammals, while the jerboas and chinchillas are distinguished by their leaping powers. Rodents are mostly harmless and inoffensive creatures, fleeing with the greatest terror and precipitancy from the smallest of foes; but a few, like the common rat, when driven to bay, will defend themselves desperately, and will then inflict comparatively severe bites with their powerful front-teeth.

"Rodents as a whole are characterized by their dull and frequently uniform coloration, although there are many exceptions to this. Indeed, many of the squirrels from the warmer regions of the globe, as well as one of the species of marmot, are among the most brilliantly colored of all animals. In the brighter-colored forms it does not appear that any rule can be laid down as to the plan of coloration. Thus while in many of the squirrels the brilliant colors take the form of distinct patches, distributed over various parts of the body, in the palm-squirrels and ground-squirrels there are light longitudinal stripes on a dark ground, and in the pacas there are light-colored spots. It appears, however, that no Rodent exhibits transverse bars of different colors on the body, and in none is the tail ornamented with alternate light and dark rings."

With the exception of the Beaver, Chinchilla and Viscacha, which have been considered in the preceding chapters, all the Rodents belong either to the Hare or Squirrel families; or to the Rat tribe, which comprises all the different families into which the mice and rats have been divided by the scientists.

HARES (LEPORIDAE).

The Hares are distinguished by their elongated hind limbs, short recurved tails, long ears, imperfect collar-bones, and large full eyes devoid of eyelids.

The frontal region of the skull is very narrow in all species of the Leporidae, and they have three pairs of premolar teeth in the upper, and two in the lower jaw. With the exception of one species, all the members of this family are very much alike in appearance and colorization, the upper parts usually being a mixture of grey and reddish brown, in which the grey or red predominates to harmonize with the general appearance of the habitat of the species.

With the exception of Australia, native hares are found in every part of the globe, although most of the species are confined to the Northern Hemisphere. The Brazilian Hare is the only member of the family found in South America. With the exception of the Rabbit and the Hispid Hare of Northern India, all species of Hares dwell in the open country in the grass and herbage or among the rocks and bushes.

Richard Lydecker says: "Hares are solitary; and each inhabits a particular spot known as its form; such form being a flattened resting-place among grass or bushes, or merely the sheltered side of some rock or stone. A hare will return to its form, as a rule, day by day, for a considerable portion of the year; but the situation is changed periodically. Hares are mainly nocturnal, going forth at evening in quest of food, and not returning to their forms till after sunrise. Their speed is great; but, owing to the great relative length of their hind-limbs, they are better adapted for running uphill than down. All the members of the genus are remarkable for their extreme timidity, and their long ears are admirably adapted to collect the least sound, and thus to give the earliest possible notice of danger. It will be observed that the ears are shortest and the legs are less elongated in the rabbit and the hispid hare than the other species. Both of these dwell in burrows, and have not, therefore, such need of protecting themselves by acuteness of hearing and extreme speed. All the members of the family breed with great rapidity; the young being able to reproduce their kind within about six months after birth. Whereas, however, the young of the true hares are born fully clothed with hair and with their eyes open, those of the rabbit and probably also of the hispid hare, come into the world blind and naked.''

The Common Hare (Lepus-europaeus) is from two to three feet long. and weighs from seven to eight pounds. The highly developed teeth are placed in a circular socket in the skull and the upper lip is divided. The under fur is of a whitish hue, but the general color of the full pelage which is white on the belly and yellowish on the cheeks, is a warm brownish grey on the top. In the winter the sides, ears, cheeks and haunches become white like the belly, and in very severe seasons and in the more northern climates the grey gradually disappears entirely. The average life of a Hare is said to be from six to seven years. They pair in March and the young are generally produced, one to five to a birth, in May or June, but in some cases the period of development is less and in others greater than the average. The short thick fur of this species is at its best in January and February, and is not only used to some extent by the furriers, but also by the fur-cutters who remove it from the pelt and use it for felting. Millions of these animals are killed every year, being valued for their flesh as well as their pelts.

The Polar or White Hare (Lepus-glacialis) is really a variety of the Common Hare, although it is longer and has the feet well padded to protect it from the snow. The Polar Hare inhabits the Scandinavian Peninsula and the extreme northern regions of both Hemispheres, showing considerable variation in character and numbers in different localities. This species is grey in summer, becoming pure white in winter, except for the black tips on the ears. Most of the millions of skins that find their way into the channels of trade annually come from Russia and Siberia; and are worked up in their natural color or dyed any hue from a black to the most delicate shades of blue and pink or the brightest red and yellow.

The American Hare (Lepus-americanus) which is closely allied to the varying hare of Scotland, is a much smaller animal, from twelve to eighteen inches long, and the skins are used principally for cutting, although some of the winter skins are dyed and worked up by the furriers. Like the European species its flesh is excellent eating. In the summer the pelage of the American Hare is brown like that of the English variety of the European species, but the under fur is blue instead of white. Dr. Richardson says: "The American Hare does not burrow. In the northern districts it resides mostly in willow thickets, or in woods where the willows or dwarf birch constitute much of the underbrush. The bark of the willow forms a great part of its food in winter, but in summer it eats grass and other vegetables. It is reported to do much damage in cultivated districts to fields of cabbage or turnips."

The Rabbit (Lepus-cuniculus) is the best fur producer of the Leporidae family, the pelt of most of the tame varieties being heavier, and the fur stronger and less liable to shed than that of the parchment skinned Hares. The European Rabbit is the most important representative of the family, and is the original of all species of wild and domestic breeds of rabbits existing in the world today.

Rabbits do not occupy forms, but in the wild state live in burrows from three to six feet deep, generally excavated in sand or loose dry soil. They avoid wet and marshy districts, and even at the seaside seek elevated positions on the cliffs or among the rocks. They are not nocturnal but inclined to avoid the scorching heat of the sun. They are sometimes carnivorous, but feed mostly on vegetable food and ravage corn fields and hop gardens. They are extremely prolific, producing from four to six young, and sometimes more, five or six times a year. The female is said to line her nest with fur from her own body. The fur of wild Rabbits is used chiefly for felting or hat making.

England at one time importing for this purpose from Australia, the enormous quantity of from 15,000,000 to 20,000,000 skins, although wild Rabbits were first introduced into the Australian colonies, where they soon became a pest, about fifty years ago.

The skins of tame French and Belgian Rabbits or Conies, which are raised in warrens or hutches, are in great demand, because of the superior quality of their fur and leather, and millions of them are used by furriers in all parts of the world every year for a great variety of purposes.

Most of the skins are dyed brown or black before being marketed, and are clipped or have the long hairs removed before they are dyed so that they make an excellent imitation of seal skin. The blue and white skins are generally sold in their natural color, either full haired or sheared, the latter often being used to make an imitation of Ermine.

The Belgian skins are about the same quality as the German. The French skins are of a higher grade, especially the large silver conies in which the dense blue underfur is covered with white and silver grey hairs. French dyed skins are darker at the roots than the English and Belgian. They are assorted according to size as X, XX and XXX, and bundled in dozens. An original case contains one hundred dozen skins. In smaller quantities they are sold in "sets" of four dozen, made up of one dozen X, two dozen XX and one dozen XXX. The Belgian skins are sorted as XX, XXX and XXXX.

NUTRIA OR COYPU RAT.

The Coypu Rat (Myopotamus-coypus), generally known in commerce as "Nutria," which is the proper Spanish name for Otter, is sometimes called the South American Beaver, because it is an aquatic animal somewhat like the Beaver in appearance and habits, swimming and diving with ease, and making its burrows in the banks of lakes and rivers it frequents, or where the banks are low building a nest on a platform in the reeds. It belongs, however, to the Rat family, of which it is the largest representative, being about two feet long, exclusive of the tail which measures from nine to ten inches.

The Coypu Rat is found only in South America. It ranges south on both sides of the Andes from Chili and Peru, being most abundant in Brazil and the Argentine Republic. Like the Beaver, it has a close, dense under-fur, protected by a covering of water hairs about three inches long. The tail is scaly, but has a thin covering of short hairs. Each of the feet have five toes, those on the hind limbs being connected by a web. It is characterized by the very large size of its incisor teeth, and by the upper molars having two folds of enamel on each side, while the lower ones have only one external and three internal folds. It is very prolific, bringing forth six or eight young at a time. The annual collection for years ranged from three hundred thousand to five hundred thousand skins.

The general color of the Coypu Rat is a speckled yellowish brown, but many are light brown in color all over, and some are nearly white, while others are almost black on the back. The best way to flay this animal is by cutting it up the back so as to preserve in one piece the good short under fur on the belly.

At one time this fur was used only for "cutting." that is for making hats; but when dehaired, the under-fur can be dyed to make one of the finest appearing substitutes for seal skin, and in this way it was for many years used by furriers in the manufacture of muffs, neck pieces, coats, and sleigh robes. It lost its hold on popular favor because the fur is inclined to curl or crinkle when it has been worn for a year or two, causing it to lose the smooth, silky appearance which makes it attractive. The Nutria skins in their natural state are worth from two and one-half to eight dollars each; and when plucked and seal dyed, from three and a half to ten dollars each, according to quality and the quantity purchased.

THE MURIDAE.

The largest family of Rodents is the Muridae, which includes many species of different genera in all parts of the world. Because of varying external characteristics they have been divided by some scientists into ten sub-families, but nearly all the representatives of this group have two incisors above and three below, rooted in some, and rootless in others; and either tuberculate or flat crowned, with angular enamel folds.

The Hamster is a stout little animal of the sub-family Cricetinae of the Muridae, that is found in parts of Europe and Asia. It is about ten inches long, has a short sparsely haired tail, and the cheek pouches which distinguish all the Cricetinae. It is very prolific and breeds readily in confinement, but the fur, although beautifully marked in orange, black and white colorings, is too short and coarse to warrant its being used for any other purpose than coat and cloak linings, and it is not very desirable even for this purpose as the pelt is too light to wear well. The Hamster burrows deeply in the ground, stores its galleries with grain in the fall and summer, and hibernates during the winter, waking up occasionally to feed from its stores.

Hamsters are most numerous in Germany and Austria, where they cause great damage to the crops by the amount of grain they consume. The cheek pouches in which they convey their winter supplies to the burrows will hold about two ounces each. Like other Rodents, the Hamster has the power of raising itself on its hind feet. The ears are short and nearly bare, and the incisor teeth, especially those of the lower jaw, are long. The belly and legs are black, but the feet and the small claws are white, and there are white patches on the cheeks and throat and also on the fore-legs.

The European Lemming (Myodes-lemmus) is very much like the Hamster in general color, being brownish grey on the upper parts and lighter underneath; it is, however, much smaller, only measuring from four to five inches in length. Its habitat is in Norway and Sweden, where at certain seasons of the year it is very abundant, moving from place to place in hordes of thousands, destroying the vegetation in its path until stopped by the sea or some other natural obstacle to its further progress. According to a writer in the Century Dictionary: "so numerous are these animals at times and so sudden is their appearance that they are fabled to rain down from the clouds." Large numbers of rapacious quadrupeds and birds hang upon their line of march, and materially diminish their numbers.

There is a kind of false Lemming in British America, and parts of the United States from Indiana and Kansas to Alaska, but the only true Lemming on the Western Hemisphere is the Hare-tailed Mouse (Cuniculus-hudsonius or -torquatus), a species which turns snow-white in winter, and is found only in Greenland and the Hudson's Bay regions.

The fur of the Lemming is of little value, being used only for cheap linings.

The Water Vole (Avicula-amphibius), commonly called the Water Rat, whose habitat is in England and France, is a fur-bearing animal although its skins are not used for fur purposes. It is an aquatic mammal, resembling the muskrat in form and habits, and living, like the European Beaver, in holes in the banks of ponds and rivers. It is strictly vegetarian, subsisting on the roots of plants, fallen apples and pears, and the bark of trees. Black specimens, and also white are sometimes seen, but generally the Water Vole has a greyish brown coat with a blue underfur like that of the muskrat, which it resembles in so many ways that some authorities think it may prove to be the same animal.

The Beaver Rat (Hydromys-chrysogaster), sometimes called the Golden-bellied Rat, is one of the few Australian mammals which possess a thick under-fur. On the back it is very much like the ordinary rat in color, but the fur on the belly is a golden or light grey hue, like that on the muskrat. The length of the body is about eight inches, and the six inch tail is very dark grey or black in color, except the part nearest the top, which is white.

THE DORMOUSE.

The Common Dormouse or Sleep-mouse (Muscadinus-avellanarius), whose soft fur may come into favor with the demand for mole skin, is confined to Europe, where its range extends from Norway and the British Isles to Northern Italy and Turkey, Galacia, Hungary and Transylvania. It is arboreal and in some of its other habits like the Squirrels, but differs from them in being exclusively nocturnal. It is generally found in hedgerows or thickets, and hibernates five or six months during the winter in a nest made of twigs, leaves and grass. It feeds on nuts, acorns, corn and wild berries, and is said to extract the kernels from hazel nuts without removing them from their stems.

The young which are usually produced in the spring, four or five to the litter, are born blind and naked, in a nest placed a yard or so above the ground. There are several species of this little animal.

The common Dormouse is about the size of an ordinary mouse, and has a thick, compact body, with a somewhat pointed muzzle on the large head. The tail is long and bushy, and the color of the fur is a tawny hue on the upper parts, but yellowish beneath, with a patch of white on the throat and upper part of the chest.

The Squirrel Tail Dormouse of Southern Europe (M.-glis) is the **Siebenschläfer** of the Germans, and the **loir** of the French. It is larger than the common dormouse, and has a thicker, bushier tail; and the heavy soft fur is of an ashy grey color shaded with dark brown above, and white on the under parts and inside of the limbs. The tip of the snout and part of the throat are white.

The Tree Dormouse (M-dryas), found in Siberia as well as parts of Southern Europe, is smaller in size than the foregoing but larger than the **Garden Dormouse**. Its habitat extends into Africa, and it was known by the ancient Romans as Nitela, and is called **lerot** in France, and the **Gartenschläfer** in Germany. **The Painted Dormouse** of Eastern Persia (M.-pictus) is a brightly colored form closely allied to the (M.-dryas).

THE MUSKRAT.

The Muskrat or Musquash (Fiber-zibethicus), which owes its name to its musky odor, is a stout, thick-set animal with a body from eight to fifteen inches long, and an eight to ten inch scaly tail that is "compressed in the horizontal plane so as to present an upper and under edge and two broad sides." The compressed form of the tail is accentuated by a line of hairs on both the upper and lower edge. The unusually wide head is not separated from the body by any clearly defined neck, and the eyes and ears are small, the latter scarcely projecting above the fur; with the exception of a small line directly around the nostrils the muzzle is completely covered with fur. The front feet, on which the first of the five toes is rudimentary, are small, but the hind feet, on which all of the five toes are fully developed, are large and stout, with the toes partially webbed, and so attached to the leg that they are well fitted for swimming; but like the Beaver, the Muskrat depends principally upon the skulling movement of its large compressed tail to propel it through the water. The pelage consists of an under coat of soft dense grey fur, protected on the back and sides by long shiny smooth dark brown hairs, making the general color grey beneath, and a deep brown above, darkest on the middle of the back. In some of the animals the hair coat is black, and in this variety the under fur is also darker.

While resembling the Beaver in the character of its fur, scaly tail and aquatic habits, the Muskrat, or Ondontra, is so closely allied to the insect eating Desman, and Indian Musk-shrew or Mongourou, that those animals are respectively known as the European and Indian Muskrats. Its actual relationships are with the Lemmings, and the Water Vole, or Water Rat, of England and France, whose skins, although it is a fur-bearing animal, are not used for fur purposes. The Vole and the Muskrat are similar in general appearance and habits, and in the construction of the skull and molar teeth, but the tail of the Vole is considerably shorter and round.

The Muskrat is not as strictly nocturnal in its habits as the Beaver, and may often be seen swimming in broad daylight. When leaping into the water to dive it makes a loud noise by striking its flat tail against the surface. The burrows of the Muskrat are long, inclining up the bank for ten or fifteen feet before they expand into a chamber with numerous passages, some leading further into the bank, and others opening under the surface of the water. In some sections they construct winter quarters or "muskrat huts," which Dr. Merriam describes as follows:

"The summit of the structure is commonly high enough out of water to admit of an air-chamber within, which communicates with the outside world by means of a hole through the center of the mass, the entrance or entrances being under water. Many of the houses contain no mud or sticks, but consist wholly of balls and knots of roots and swamp-grasses. It seems clear that the animals make no attempt to construct a dwelling of any particular shape, but merely heap the materials together without plan or order, the resulting mound naturally assuming, in a general way, the form of a flattened cone. As the Muskrat feeds on fruits, vegetables and roots, it will be observed the materials of which the hut are composed are such as serve as food for the animals during the long winters; hence the Muskrat's hut is in reality a storehouse, which he devours piecemeal as the winter advances.

"The nest is usually placed in a burrow in the bank, although occasionally in the aforesaid hut. Here from five to nine blind and naked young are produced at a birth, and it is reported that there may be as many as three litters in the course of a season."

The Muskrat is one of the commonest quadrupeds of North America, living on the banks of lakes, rivers and pools in every part of the continent. Owing to its numerical strength and the many purposes for which its fur is used the Muskrat is as valuable commercially as the animal is common, upwards of five million skins being consumed every year. There are two collection of skins annually, one in the late fall and another in the spring of the year. The best skins are those taken in December, January and February when the animal is in full fur; next in value are the so-called winter skins, and the poorest in quality are what are known as "Fall Rats." The skins of the very young animals called "Kitts" are of little value. The question of locality enters largely into the grading of the skins. Muskrats are generally taken in traps, and most of the skins come to the market cased.

MUSKRAT

With the exception of the black skins, which are found principally in the southern part of its habitat and are always used in their natural state, a large part of the Muskrat skins are plucked—that is, have the long top hairs removed—and the ground fur is dyed to make the rich substitute for seal skin known as "Hudson Seal." Sometimes the skins are blended with the top hairs left on to resemble the mink, when they are sold as "River Mink" Most of them are used in their natural state and color to make linings for coats, or in the manufacture of muffs or other small furs, which are sold as "Brook Mink."

THE SQUIRREL FAMILY.

The Sciuridae, or Squirrel family, show a wide range of variation, passing from the heavy terrestrial marmots or ground hogs, with their short limbs, ears and tails, through the Chipmunks, and Spermophiles or Susliks, to the graceful arboreal Tree Squirrels with slender limbs and long tails, and the ariel Flying Squirrels. The family is widely distributed, being represented in all parts of the world except Australia. True Squirrels abound in the torrid as well as the temperate zone, but the ground squirrels are found only in the temperate and colder latitudes. The center of abundance is in Asia. Africa also has a long list of species, and North America comes next, being especially rich in the number and variety of its ground squirrels. The eastern European and Asiatic Marmots are the most numerous and valuable commercially. Only a few species of the Sciuridae are represented in Europe and South America.

The range of the Common Squirrel (Sciurus-vulgaris), which is the type representative and finest furred species of the Tree Squirrels, extends through Europe and into Asia. The best skins come from Siberia and Russia, those from the eastern side of the Ural Mountains being grey and in some cases almost blue; the darkest skins having the greatest value, if free from the reddish cast that shows in many of the species on the Continent of Europe, and which is characteristic of most North American tree squirrels. Too much dependence, however, must not be placed upon colorization in deciding the geographical location of a species, as one variety of the Western Continent is called the Grey Squirrel.

All Tree Squirrels have large pointed ears, long bushy tails, and are able to sit up on their haunches, and use their fore-paws like hands, and the Common Squirrel has pencil tufted ears like the lynx. The bellies of this species are white, and the tail, which is quite as long as the ten inch body, is very bushy. Tree Squirrels are active and agile, living in the trees, although they often descend to the ground and run about there and feed on all kinds of nuts and hard fruits. They usually bring forth three or four young twice a year, and hibernate to some extent in the colder latitudes. They are easily tamed and make interesting and inquisitive pets.

The American species that approximates closest to the Sciurus-vulgaris is the Chickaree or Red Squirrel (Sciurus-hudsonianus). in fact some naturalists believe that the Chickaree, and the American Grey Squirrel (Sciurus-carolinensis), and the European Common Squirrel are all geographical varieties of the same species, although the American species are uniform in color all over the body while the old world species have white breasts.

There are many other species or varieties of tree Squirrels, but those that have been mentioned are the most important, and in fact most of the world's supply of squirrel skins for fur uses is derived from the Sciurus-vulgaris of Russia and Siberia, where the animals have better pelts and thicker, softer fur than those of other regions.

As early as 1839, 2,730,826 squirrel skins were imported into England alone, and at the present time the number of skins used in different parts of the world is enormous. They are worked up whole, or the backs are cut out to make coats, muffs and neck pieces, while the bellies, which are lighter furred, are used for linings. Many of the skins are dyed and blended sable color, and others are changed so as to make a good imitation of chinchilla.

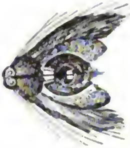
Squirrel tails were formerly extensively used in the manufacture of string boas, and the dressed tails were sold by the hundred. The raw tails are sold by weight, six to nine pounds being the recognized weight of one thousand tails.

It is a notable fact that the fur of the squirrel, which in red in England, becomes grey as we approach the eastern part of Europe, and grows darker and darker as we journey further east, until it almost reaches a black color in Japan. The province of Kazan in Russia furnishes red and reddish grey skins, Viatka and Kargopol skins are greyer, and those from Obskoi are a clear grey. Light blue skins are found in Yeniseisk, and deep blue ones in the valley of the Lena river. In the provinces of Yakutsk, Okhotch and Sakiminoi the color of the body is a very dark blue and the ears and tails are black.

CHIPMUNK.

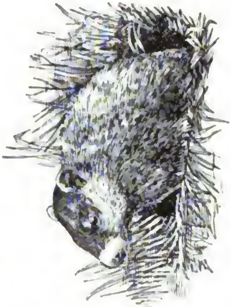
RUSSIAN MARMOT.

COMMON SQUIRREL.



CHEEK POUCHES.

SPERMOPHILE.



WOODCHUCK.

THE CHIPMUNKS.

Chipmunks are often called Rock Squirrels because they make their nests in crannies in the rocks or other places on the surface. instead of living in underground burrows. They are closely allied to the tree squirrels. but they are given a separate genus because they have pouches inside the cheeks, a slenderer and narrower skull. shorter ears and tail. and the first premolar tooth in the upper jaw is either absent or very minute; they are also characterized by a peculiar coloration, that shows them to be the connecting link between the arboreal tree squirrels. and the ground squirrels like the susliks or spermophiles.

The Common American Chipmunk (Tamias-striatus), a small animal six inches long, with a four-inch tail, takes its name from an American Indian word meaning the hacking or chipping squirrel. Its range extends from Canada and Manitoba through the eastern section of the United States into Georgia and western Missouri; the long-eared Chipmunk of California (Tamias-macrotus), and other western varieties, are distinguished from it by the greater length of their ears and other characteristics. The common Chipmunk is sometimes about the size of the European squirrel, and in some localities has the same ground color, but is always distinguished by the black stripe running down the middle of the back and the white stripe with black edges on each of its sides, as well as the two white stripes separated by a black one above and below each eye. There is considerable local variation in the ground color, that of the southern Chipmunks being much lighter than that of those in the northern portions of their habitat. They are the commonest of North American rodents, and are migratory in their habits, being abundant in a certain district one year and entirely absent the next. They feed principally on beech mast, but also consume corn and roots and the larvae of insects. According to Dr. Merriam; when the beech nuts are abundant in the Adirondack Mountains the Chipmunks put in an appearance in September, and by October the woods are alive with them. "They immediately establish themselves for the winter, and begin to hoard up large stores of food. They are the least hardy of our squirrels, commonly going into winter quarters before the middle of November, and though early thaws sometimes bring them out in February, rarely appearing again in any numbers until the warm sun in March or April has caused bare spots to appear between the snow banks. In running from tree to tree, even when not pursued, the length of their bound is from twenty-five to thirty-four inches—a long leap for so small an animal." The young are born in the spring, and live in their nests until June; and as there is seldom a good crop of beech nuts anywhere two successive years a migration generally begins in July. The Chipmunk usually keeps to the ground, though it will at times run a few feet up the trunk of a tree, and when pursued may even take refuge among the branches. It does not burrow like the spermophiles.

The Siberian ground squirrel (Tamias-asiaticus), which is also known as the Siberian Chipmunk, is found in northern Asia and extends into Russia. This species differs from the Common American Chipmunk in that it has four light colored and five black stripes on the body and has a longer tail. A number of other varieties of Chipmunks are also found in North America, from the barren grounds to New Mexico and Arizona.

THE SUSLIK OR SPERMOPHILE.

The Suslik or Sisel (Spermophilis-eitillus), is confined to Europe, Asia Minor and Asia north of the Himalayas; but the North American Spermophile, which is never seen on the eastern slope of the continent, belongs to the same genus. These animals have skulls like the squirrels, but are characterized by large cheek pouches, and such distinctive coloration and markings that even the striped specimens need never be confounded with the Chipmunk, which is found in nearly the same regions of the Northern Hemisphere. There is considerable variation in the size of the ears and the length of the tail, but the first toe on the forefoot is always rudimentary in all the species of the Spermophilis, although a nail is sometimes present. Everman's Suslik (Spermophilis-eversmanni) is the only Old World species that has a long tail.

The common Suslik of Central and eastern Europe and Siberia, an animal about the size of the European Squirrel, is uniform in color, and has a very short tail and minute ears. The long-eared species (Spermophilis-grammurus), whose range is on the Western Continent from the Mississippi valley to California, has a long bushy tail and large tufted ears. The thirteen lined or Leopard Spermophile (Spermophilis-tridecemlineatus), which is the commonest species in America, and is found from the Red River to Texas, has small ears and a tail about two-thirds as long as its eight-inch body. In color it is dark reddish above with six to eight longitudinal light stripes, alternating with from five to seven rows of light spots. The under parts are yellowish brown in the middle, bordered on the sides with yellow and a narrow black band runs between the two tints.

All species of Susliks prefer the open plains for their burrows, which descend from six to eight feet, and have but a single entrance. When the animals retire for their winter sleep they make a second passage from their sleeping chamber, to within a short distance from the surface. Through this they make their exit when they awaken in the spring, and block up the original entrance.

The roots, seeds and berries for the winter's supply of food are accumulated in the summer and autumn, during which time the Susliks will also eat mice and small birds and their eggs. The young are born in the spring, from four to eight to a litter.

The striped Spermophiles of North America are more carnivorous than their European cousins. In the extreme southern part of their habitat they remain active all winter, but the northern species hibernate during the cold weather.

Parry's Suslik (Spermophilis-empetra), a species closely allied to Evermann's Suslik, is found in the vicinity of Hudson Bay and the Bering Sea.

It is hard to understand why the graceful, slender, kindly dispositioned Spermophiles are ever confounded with the thieving Pocket Gophers, who belong to a separate family, the members of which are all so ill tempered that they hate one another. Possibly it is because both of these animals make their burrows deep down in the ground below the frost line.

The habitat of the Flying Squirrel is more restricted than that of the other true squirrels, but there are eight or more species in different parts of North America, Asia, Africa, Japan and the Malayan Islands.

THE MARMOT.

The Marmot is found in America, Europe and Asia; and is known in some localities as the bear-mouse, and in others as the ground-hog and woodchuck; the Wish-Ton-Wish, or prairie dog of North America, is not a true marmot, but very similar to it in size and many of its habits. The Marmot is the largest living representative of the squirrel family. It has a stout, thickset form, and a short bushy tail. It is characterized by the absence of cheek pouches, and by the flat nail with which the rudimentary first front toe is furnished, as well as by certain peculiar features of the skull and cheek teeth.

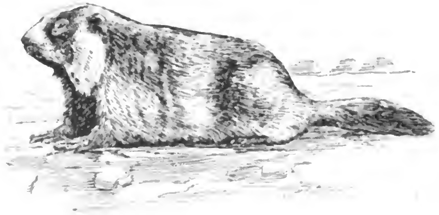
The most widely distributed species on the North American continent is the Arctomys-Monax, called Weemusk by the Cree Indians, and known in commerce as the Quebec Marmot and Woodchuck.

The Yellow-Bellied Marmot (Arctomys-flaviventer), found only in the Rocky Mountains, and the large Hoary Whistling Marmot (Arctomys-pruinosus), are not so numerous; and none of the American species are of much value commercially. Europe has two species; the Alpine or true Marmot (Arctomys-marmotta), and the **Eastern or Russian Marmot** (Arctomys-bobac). Besides the Arctomys-bobac there are numerous unimportant varieties in Asia, one of which, the Red Marmot, is a much larger animal and has a much longer tail than any of the other species.

The skins used in commerce come principally from southern Russia and Siberia, where these animals exist in vast numbers, consuming the growing grain and other crops, and annoying the farmers with the large hillocks they throw up in making their burrows. The burrows often descend to a depth of from seven to ten feet, and besides the main entrance have another opening to be used as an avenue of escape in case of emergency. Each burrow is tenanted by a family of from ten to fifteen members, but there are always large colonies where these animals collect, either in the mountains or on the plains in the north.

In the winter when the snow comes the Marmots retire to their burrows and hibernate. According to some authorities the Russian Marmots lay in a supply of food before the winter begins, but others claim that they are not known to lay in any store of food before their retirement, and that their sleep is probably unbroken from the time they begin to hibernate in October until they come out in the spring. If either of these statements are accepted as true, the Russian Marmot differs in this respect from the **American Woodchuck,** which causes so much trouble by coming out of its hole on Candlemas Day to look for its shadow, no matter how much snow there may be on the ground.

Marmots are all terrestial and fossorial, and some of the habits that the Russian Marmot is said to have in common with the **North American Prairie Dog** are sitting on its haunches, whistling, etc. The Russian Marmot is about the size of a rabbit and has a greyish yellow fur that is browner on the head than on the body, and darker at the roots than at the tips. It feeds on roots, leaves and insects, and is very prolific, often producing nine young in a litter. It can be domesticated, and taught to feed on carrots, cabbages and other vegetables.



RUSSIAN MARMOT

The skins are used for a great variety of purposes, either in their natural state or dyed, but they are principally consumed in the manufacture of linings for coats; when they are dyed brown and striped they are sometimes called "Florida Mink" and "Mink Marmot"; and they are also marked so as to make a good imitation of the leopard.

THE UNGULATA.

The Ungulata, or hoofed mammals, constitute one of the largest and most important orders of the animal kingdom. They are all herbivorous ruminants with a few notable exceptions that are omnivorous; and none of them have the digits of the fore or hind limbs provided with either claws or nails, as is the case with other animals.

In the great majority of cases the toes of Ungulates are encased in solid hoofs, although a few species are furnished with broad flat nails. Many extinct forms have four or five well developed digits to the limbs, but in all living members of the order except the elephant which has five, there are never more than four functional digits; and in a large number of instances these functional digits are reduced to two, and in some cases to three, while in the horse and its living allies only a single digit remains.

Richard Lydecker, in his "Royal Natural History," says: "As it is of primary importance in order to have a clear idea of the manner in which this reduction of digits takes place, to understand the relationship of existing Ungulates one to another, the subject may be dealt with in some detail.

"In all the Ungulates the limbs have entirely ceased to be used as organs of prehension, and there would seem to be no necessity as development advances why there should be any adherence to the primitive five-toed type. The majority of the members of the order being, however, unable to protect themselves against foes, and being also, in proportion to their height, heavy-bodied animals, the attainment of a high degree of speed was essential to their well-being and development, if not for their actual existence. For such a kind of life it will be obvious that the greater the length and slenderness of limb, the greater will be the speed. Now, in order to produce a long and slender, and at the same time a strong limb, from a stout and short-toed one, greater strength will clearly be attained by reducing the number of the toes, and lengthening and strengthening those which remain, rather than by lengthening the whole of the five toes, the slender bones of which would be liable to fracture by the concussion of the solid hoofs against the ground. Accordingly, among the Ungulates, the plan has been to gradually lengthen and strengthen the bones of one or more of the original five toes, and at the same time to dispense more or less completely with the others.

"A complete transition has thus been traced from a five-toed Ungulate, walking partly on the soles of its feet, to one provided with but a single toe to each foot, and walking entirely upon the very tip of that one toe, by which means the full extent of the limb comes into play as an aid to speed. Throughout this series it is the third or middle toe which has undergone development at the expense of the others; and since this toe is always symmetrical in itself, the term Odd-Toed Ungulates is applied to the members of the group thus characterized.

"The resources of nature are, however, manifold, and instead of this being the only line of evolution of the Ungulates, nearly similar results have been reached by a totally different series of modifications; in some cases instead of the third toe remaining symmetrical in itself and gradually increasing in size at the expense of the others, the third and fourth toes become symmetrical to a vertical line drawn between them. When this takes place the first toe disappears, and the second and fifth become diminished in size; an instance of this stage of development being presented by the pig, where the two large and medially-symmetrical toes represent the third and fourth of the typical series, while the two small lateral ones are the second and fifth. In the pigs all the metacarpal bones remain distinct and relatively short; but in the water-chevrotain of Africa the third and fourth metacarpals become much elongated and closely applied to one another, while the second and fifth are reduced to mere splints, and their toes so diminished as to become practically functionless. Finally, in the deer, oxen, and their allies, the third and fourth metacarpals in the fore-limb, and the corresponding metatarsal bones in the hind-limb, have become completely fused into a single rod-like bone, corresponding in function with the cannon-bone of the horse, and generally known by the same name. The dual origin of this cannon-bone is, however, proclaimed by the formation of its lower extremity, which carries two pulley-like surfaces, with which the bones of the two functional toes (the third and fourth) articulate.

"Since all the Ungulates displaying this second modification of foot-structure agree in having the third and fourth toes arranged symmetrically to a line drawn between them, they are collectively termed the Even-Toed Ungulates.

"It is accordingly evident that although a few living Ungulates, like the elephant and the hyrax, retain a generalized type of foot, the greatest number of the living representatives of the order are characterized by their more or less markedly specialized feet.

"As regards their teeth, the Ungulates are characterized by those of the cheek-series having broad crowns, surmounted either by columns or transverse ridges, and adapted for grinding and masticating vegetable substances. In the more specialized forms, like cattle and horses, these cheek-teeth have their columns or ridges of great height and closely approximated to one another, in consequence of which the bases of the hollows or valleys by which these columns or ridges are separated from one another, cannot be seen when the tooth is unworn, while the pattern produced on the crown by the wearing down of these columns or ridges is complex. On the other hand, in the more primitive types, such as pigs and tapirs, the crowns of the cheek-teeth have low columns, or ridges, so that the bases of the intervening valleys can be distinctly seen at all stages of wear.

"It should also be mentioned, that whereas in Carnivores the upper molar teeth are generally of the primitive triangular type, in all existing Ungulates they have assumed the quadrangular form. The food of the Ungulates consisting in most cases entirely of vegetable substances requiring much mastication, is the inducing cause for the complex structure of the cheek-teeth in the more specialized kinds; and to the same cause may be attributed the circumstance that Ungulates always retain the full number of molar teeth, and, except in the camels, at least three out of the typical four premolars.

"The order is well represented on all the continents of the globe, with the exception of Australia, but at the present day it has a far larger number of species in the Old World than in the New; many of those from the former area belonging to groups quite unknown in the latter. Although represented in the Arctic regions only by the reindeer and the musk-ox, Ungulates are found alike in the coldest and the hottest regions of the globe. The maximum number of peculiar forms, as well as those of greatest corporeal bulk, are, however, inhibitants of the tropical and subtropical regions; and it is also in the warmer regions that the greatest number of species occur."

Collar-bones are invariably absent in all the species of the Ungulata, and their limbs as a rule are restricted to a backward and forward motion; while all of them are adapted to a life on land, most of them can swim if necessary, and none of them are arboreal; as a rule they are characterized by their relatively large size, the order including the most bulky of all mammals; and most of them have a tendency to develop horns of some kind or other on the head.

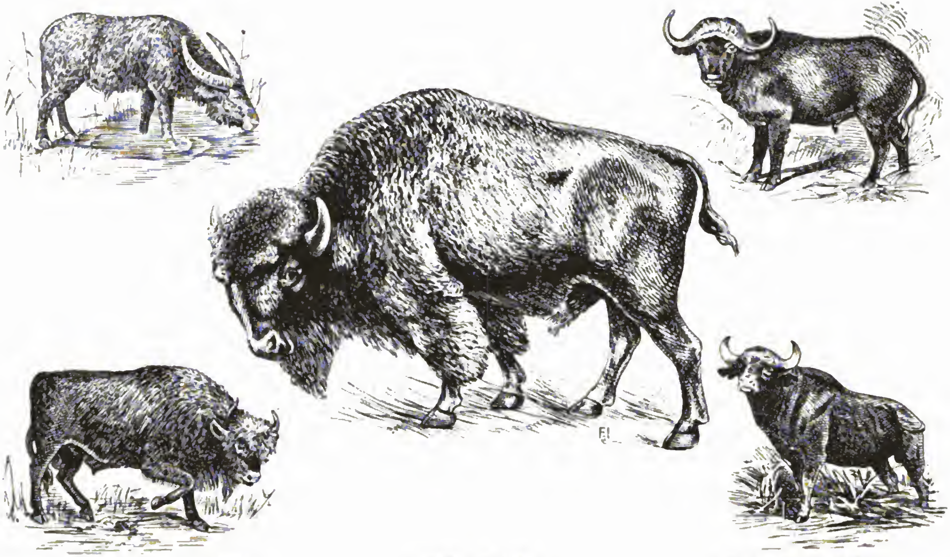
HOLLOW HORNED RUMINANTS.

Under the name Hollow Horned Ruminants are included only the oxen, sheep, antelopes and goats; but the deers, swine, camels and some other types also belong to the even-toed or cloven-footed Ungulates.

Some scientists include all the Hollow Horned Ruminants except the Prongbuck or Blessbok (Bubalis-albifrons), in the family Bovidae;but others place only the oxen in the Bovidae, and put the Antelopes, Camels, Deers, Goats, Sheep and Musk Ox into separate families, known respectively as the Antelopinae, Camelidae, Cervidae, Capriniae, Ovinae and Ovibromae. These Hollow Horned Ruminants, together with the Giraff, form a division distinguished from all the other Even-Toed Ungulata by the absence of front teeth in the upper jaw, the possession of complete cannon bones, and hoof enclosed feet, and four chambered stomachs "divided into four complete cavities, into the first of which the food is temporarily received until it is regurgitated into the mouth, when it is completely masticated, and afterwards conveyed to the true digesting stomach. This process is known as the function of 'chewing-the-cud,' or ruminating; and the Ungulates in which it occurs are consequently termed Ruminants. The ruminating function is, however, developed in the camels and chevrotains, as well as in the assemblage of four families constituting the present group; but as the camels and chevrotains differ in several important respects, it is convenient to designate the group under consideration as the true Ruminants, or technically, the Pecora.

"The Hollow Horned Ruminants are distinguished from their allies by the presence of true horns; that is to say, of hollow and unbranched sheaths of horn growing upon bony protuberances, or cores, arising from the frontal bones of the skull, neither the horny sheaths nor the bony cores being shed at any period of existence. In all existing wild species these horns are present at least in the male sex; but in many domesticated races of cattle, sheep and goats, they are absent in both sexes; and the same holds good for certain extinct members of the family. Usually the molar teeth of the Hollow Horned Ruminants are characterized by the great relative height of their crowns; and in all cases there is no tusk or canine tooth in the upper jaw. In some few instances the small lateral toes may be completely absent, but they are generally represented merely by the small spurious hooflets alone, which may be supported internally by minute and irregularly-shaped nodules of bone.

"The Hollow Horned Ruminants are chiefly Old World forms, although they are represented in North America by the Musk-Ox, the American Bison, the Rocky Mountain Goat, and the Big Horn Sheep. They are quite unknown in the southern half of the New World."



COMMON BUFFALO (INDIA)
EUROPEAN BISON

AMERICAN BISON

CAPE BUFFALO (AFRICA)
GAUR

THE BUFFALO.

The American Bison (Bos-americanus), is generally known as the Buffalo; but the Buffalo is an entirely different animal, found in its wild state only in India and Africa. There are four distinct species of this animal, the fiercest and largest, being the **Cape, or Black African, Buffalo** (Bos-caffer), whose habitat is generally in the reedy swamps from the Cape to the equator; but a modified variety of this species is found from the equator north to Abyssinia. The hair covering of the Cape Buffalos is always thin, and in old age the skin is almost bare. They are heavily built, and a full-grown male will stand four feet six inches at the shoulder. They have flattened, curved, black horns, that meet at the base forming a great bony plate on the front of the head; the horns sometimes measure three feet each in length, but they are so curved along the line of the head that the span from bend to bend is about three feet and six inches; the flapping ears are of enormous size, and are thickly fringed with hair on the lower border.

Cape Buffalos are usually seen in herds of from fifty to three hundred individuals. They are swift in their movements, and according to Mr. Selous: "When charging they invariably hold their noses straight out, laying their horns straight back over their shoulders, and lowering their heads only as they are about to strike." They live as near the water as possible in summer, and at sundown they refresh themselves with a bath before feeding. They breed during the African summer, and calves are born in January, February or March. The Cape Buffalo sometimes lives to be thirty years old. According to W. H. Drummond, there is a variety of Cape Buffalo occasionally met with in the forest with blacker hair and more spreading horns than the type species.

The **Short Horned, or Red Buffalo** (Bos-pumilis), whose habitat is in West Africa, is smaller than the foregoing, and has a heavier, lighter colored coat of hair, in some cases light yellow on top and reddish brown below, with a sharply defined line of demarkation. The Buffalos found in the Congo district (Bos-centralis) are larger in size and have much flatter horns than the (Bos-pumilis.)

The **Common, or Indian Buffalo,** (Bos-bubalus), differs from all the African species in appearance. It is larger, has a much longer head, and smaller ears; the horns are very large and flattened, tapering gradually from the root to the tip, and being much longer and thinner in the cows than in the bulls. Lydecker says; that a skull of this species in the British Museum, has horns measuring twelve feet and two inches from tip to tip along the outer curve; and he also tells of a specimen measured by General Kinlock, that stood five feet high, had a girth of eight feet and three inches, and was nine feet and seven inches long from the end of the nose to the root of the tail, the tail measuring three feet and eleven inches more; the horns on this animal, along the greater curve, measured eight feet and three inches.

The hair on the Common Buffalo is short and scanty, slightly longer on the head, shoulders and front of neck than on the rest of the body, and almost black in color. The Asiatic Buffalo are further distinguished from the African species, by having the hair on the front part of the back directed forward, as well as by a less thickly fringed beard, and more elongated and narrower heads. The general color of this species is ashy black, although the legs are whitish and sometimes the domesticated animals are pure white below the knees. The wild Indian Buffalo is rarely found in the open plains, and its habitat is generally in tall grass jungles, of such height and depth, that General Kinlock in referring to them writes: "Frequently, although a herd of Buffalo may be aroused within a score of yards, the waving of the grass, and perhaps the glint of a polished horn tip, is the only ocular evidence of the presence of these animals. The nearly noiseless tread may be caused by other animals; and where the horns have not been seen, it is only by the strong sweet smell—similar to, but much more powerful than that of cows—that we can be absolutely certain of what is in front of us." This species feed chiefly on grass, are not shy, and are always seen in herds. The calves are born in summer, sometimes two at a time. In walking the Indian Buffalo always carries its head low. It loves the moist ground, and its broad feet prevent it from sinking into the mud.

The Common Buffalo has been domesticated in India, and from there introduced into Greece, Italy and Hungary. It is much more powerful than the Ox, and although in a wild state it is savage and dangerous and retains its courage in captivity, it is very docile when domesticated. It is much heavier than the Ox, and distinguished from it by its sparcely haired skin, long tufted tail, broad muzzle and angulated horns. In India this animal gives more milk than the ordinary cow, and from it the ghee—the clarified butter of India—is made. The hides of the Buffalos are valued where strength and durability are desired.

THE EUROPEAN BISON.

The Gaur (Bos-gaurus), is a magnificent animal; but just why it should have usurped the name of the European Bison (Bos-bonasus), is as hard to understand as the reason why the bison should so often be called Aurochs (Bos-primigenius), a species of European Wild Ox, now extinct, which was the progenitor of some of the existing breeds of domestic cattle.

The European Bison with its fourteen or fifteen pairs of ribs, cylindrical horns, and short forehead, resembles the Yak (Bos-grunniens) more than it does either the Gaur or the Aurochs. It differs from the Yak in certain cranical characteristics, as well as in the great excess in height of the withers over the hind quarters, which produces a distinct hump on the shoulders, that is intensified by the mass of dark brown hair, similar to that on the American Bison but not so abundant, with which the head, neck and shoulders are covered. The long hair is continued as a kind of crest along the back nearly to the root of the tail, the remainder of the body being covered with a short curly hair of a lighter tint; its tail, unlike that of the American Bison, is covered with hair the full length and is tufted on the end. In many respects the European Bison resembles the American species to which it is very closely allied; but it has longer legs and a shorter body, shorter hair, more tubular eyes, and longer and straighter horns. It is a forest dwelling animal, feeding largely on leaves, twigs and the bark of trees. The calves of this species are born in May or the early part of June, and apparently the cows do not produce more frequently than once in three years.

The European Bison formerly ranged in considerable numbers over a large part of the continent of Europe and England; but in 1892 the herds had decreased to less than five hundred individuals. Since that time, owing to government protection, there has been an increase; and in 1906, it was estimated that, in addition to the small captive herds belonging to the Czar of Russia and the Prince of Pless, there were about seven hundred wild Bison on the northern slope of the Caucasus, and an equal number protected by the game wardens of the Czar in the forests of Bielowitza, and Swisslotsch. The wild European Bison live in small scattered bands, sometimes at an elevation of eight thousand feet, where they are exposed to extreme cold; but they are much less thickly haired than those found in the forests of Lithuania.

THE GAUR.

The Gaur (Bos gaurus), the Wild Ox of India, whose range extends into Burma and the Malay Peninsula, is the handsomest and tallest ox in the world, the cows standing five feet and the males sometimes reaching six feet, at the shoulder. It is characterized by its short tail, white legs, narrow pointed hoofs, large ears, the forward curve and great elevation of the ridge between the compressed, short, conical horns that are very thick at the base, and the distinct ridge running from the shoulders to the middle of the back, where it ends in an abrupt drop of about five inches.

The top of the head is ashy white, but the color of the rest of the body is a dark brown or black in the older males, and a paler reddish brown in the cows and young bulls. The hair is short, fine and glossy.

The Gaur prefers the hilly districts to the plains, and in India is generally found at an elevation of from two to five thousand feet. It is not known to exist in a domesticated state, but the Gayal, a much smaller animal differing from it in the formation of its skull and horns, is believed by some to be a modified variety of the Gaur.

THE YAK.

The Yak (Bos-grunniens), is found only on the elevated plateau of Tibet. The color, with the exception of a little white around the muzzle, is a blackish brown. The hair on the head and the upper part of the body is short and nearly smooth. On the flanks, breast and the under part of the limbs, the thick hair, which protects it from the cold and snow, grows to a great length, giving the animal an ungainly appearance; on the thick, bushy tail the hair is often twenty-five inches long. The head of the Yak is long and narrow and the ears and muzzle small. The shoulders are high, but the back is otherwise straight without any falling away at the hips. It has short stout legs and large rounded hoofs. The horns are nearly cylindrical and curved upwards and out. The Yak is nearly as large an animal as the Gaur.

The Wild Yak is impatient of heat and delights in the cold; it is only found near the limits of perpetual snow, often seeking an elevation of from fifteen to twenty thousand feet in summer.

The Yak is an unsociable animal, but breeds in confinement and can be crossed with other cattle. The grunt of this animal is so much like that of the pig that the Germans call it the Grunzochs.

The domesticated Yak is much smaller than the wild variety, and shows considerable variation in color, sometimes being entirely white. It is about the size of an ox, and can stand a much higher temperature than the wild Yak. It is covered all over with long silky hair, hanging down like the fleece on a sheep. The head is rather short; the eyes large and beautiful; the horns, which are not very large spread and taper from the base, and are turned back a little at the tips; the space between them on the forehead being covered by a mass of curly hair; the neck is short and over the shoulders there is a bunch of long hair.

The meat of this animal is good for food; and the silky hairs are spun and woven into fabrics. The tails, especially the white ones, are largely used in the manufacture of wigs. In Tibet the tails are suspended as streamers from poles set before the entrances to the monasteries; and in China they are dyed red and affixed as pennants to the roofs of summer residences. They are used throughout the East as fly wisps or "chouris."

THE AMERICAN BISON.

Of the American Bison (Bos-americanus), W. T. Hornaday says: "The magnificent dark brown gauntlet and beard, the shaggy hair upon the neck, hump and shoulders, terminating in a thick mass of luxurient black locks, to say nothing of the dense coat of fine fur on the body and hind quarters, give to our species, not only an apparent height equal to that of the Gaur, but a grandeur and nobility of expression which are beyond all comparison among Ruminants."

The possession of a larger and more luxuriant mass of hair on the head and fore quarters, which in some cases almost sweeps the ground, makes the American Bison appear of larger size than the European species, when, as a matter of fact, although the body is on the whole more massively built, it is lower, and has a smaller pelvis and hind quarters. The American Bison is one of the largest and the best known of all North American hoofed mammals; and with two exceptions, the Gaur and the European Bison, it is the largest of all Bovenine animals. The males, who have short, thick, curved horns, stand from five feet to five feet eight inches at the shoulders, though they are considerably lower at the hind quarters. In fresh pelage the color of the long hair on the calves is of a reddish hue; but on the full grown animals it is almost black, although on aged or worn skins it becomes brown or grey. The twenty inch tail always has a six inch wisp of long black hairs on the end. The head is convex, the muzzle is shorter and broader, and the skull is much wider than in domestic cattle.

According to Mr. Hornday: "The range of the American Bison originally extended over one-third of North America. Starting almost at tide water on the Atlantic coast, it extended westward to a vast tract of dense forest, across the Alleghany mountain system to the prairies along the Mississippi, and southward to the delta of that great system. Although the great plain country of the West was the natural home of the species, where it flourished most abundantly, it also wandered south across Texas to the burning plains of northeast Mexico, westward across the Rocky Mountains into New Mexico, Utah and Idaho, and northward across vast treeless wastes to the bleak and inhospitable shores of the Great Slave Lake itself.

"Of all the quadrupeds that ever lived upon the earth, probably no other species has ever marched in such innumerable hosts as those of the American Bison. It would have been as easy to count or estimate the number of leaves in the forest, as to calculate the number of Bison living at any time during the history of this species prior to 1870. Even in Central Africa, which has been exceedingly prolific in great herds of game, it is probable that all the herds taken together on an equal area, would never have more than equalled the total number of Bison in this country fifty years ago." But as Captain Chittenden says: 'Marvelous as were the numbers of the Buffalo, their complete disappearance from the earth in less than a generation is more marvelous still.'

When the Union Pacific Railroad, in 1869, cut the range of the Bison in two, the southern, or Texas, herd, in the regions of the staked plains, numbered nearly four million individuals; and there were over one and a half million in the northern, or Yellowstone, herd on the upper Missouri, and to the northward. It is estimated that over three and one-half million of the southern herd were slaughtered between 1872 and 1874, and by the end of 1875 this great herd had ceased to exist as a body; the survivors, numbering about ten thousand, fleeing to the wildest parts of Texas where they were gradually exterminated.

Of the northern herd those living in British Columbia were the first to be exterminated; and before 1880, the herds in Dakota and Wyoming had also been greatly reduced by the Sioux Indians, who ate the flesh, ornamented their dress with the hair, and used the hides of the Bison to make their lodges, boats, shields, beds, clothes, moccasins, bow-strings, saddles and halters, and the hoofs, horn and bones for manufacturing an endless variety of other articles . Trutly, as Captain Chittenden says: "more than the horse to the Arab, the camel to the pilgrim in the desert, the reindeer to the Laplander, the seal to the Eskimo or the elephant to the Hindoo, was the Buffalo to the trans-Mississippi Indian. History affords no other example where a single product of nature, whether animal or vegetable, has filled so large a place in the life of a people. The self-sustenance of the tribes of the plains would have been impossible without it, and when the Buffalo disappeared these tribes fell back upon the government in hopeless dependence for the very necessities of existence.

"This remarkable animal (Bos-americanus) furnished nearly everything that the Indians wanted, and in the life of the trapper as well it was a principal resource. Almost every part of its huge body was utilized, and a volume would be required to catalogue its manifold applications. The hide was dressed in a variety of ways, each special treatment having its particular use.

"The flesh of the Buffalo was the most wholesome, palatable and universally used of that of any wild animal. The extent of its use, that is, the degree to which the entire animal was thus utilized, depended upon its abundance. When there were multitudes at hand the epicurean palate rejected all but the choicest morsels, but in times of scarcity every part of the flesh did duty as food. The greatest luxury was the tongue and this was often the only part taken. The hump ribs and the tenderloin came next in favor, but the smaller parts, such as the marrow bones, liver and gall, and parts of the intestines, were often devoured with avidity while the process of butchering was still going on. The fleece fat upon the animal's back was generally thick and rich, and was an important article in the process of cooking.

"All authorities unite in praising the excellence of buffalo meat, and the true plainsman would never admit that the domestic beef could approach it. It always agreed with the digestion and it seemed impossible to overeat of it. Combined with the healthfulness of the open-air life on the prairies or in the mountains, it formed a perfect food whose virtues became widely known; and many an invalid has recovered his health on the plains with no shelter but the sky and no food but the meat of the buffalo.

"The methods of capture were various. With the Indians wholesale destruction was commonly resorted to by alluring vast herds at full gallop to the brink of a precipice or into the mouth of an artificial enclosure. The force of the mass behind crowded those in advance ahead until they fell upon each other at the foot of the cliffs or in the enclosures, and were thus slaughtered by the hundreds. A great deal of skill and favoring conditions of wind, as well as the most adroit management on the part of the Indian who clad like a buffalo acted as decoy to the herd, were essential to the complete success of the maneuver. These hunts were matters of great ceremony among the Indians. Days and weeks were devoted to preparation, with due observance of the established religious rites of the tribes, and the most rigid laws against individual hunting or frightening of the herds.

"The true sportsman-like attack was by direct onslaught on horseback, or, as it was sometimes called from the manner of approach "the surround." It was managed with the same ceremonious preliminaries that were observed by the Indians in all great buffalo hunts. The attack was made by riding under strict discipline in careful order directly upon the herd until the latter had fully scented the danger, when the hunters, each free to go where he chose, broke into a wild gallop and amid the thunder of hoofs, the bellowing of the frightened beasts, and the clouds of dust raised in the mad rush of so many animals, fell pell-mell upon the herd, chasing and slaying. So completely panic-stricken would these mighty herds become, and so little sensible of where to flee, that most of them fell victims to their pursuers, and the ground where the attack took place would be strewn with hundreds of dead bodies. Now and then, when some infuriated monster turned too quickly upon him, a luckless hunter would be unhorsed, or even slain in the confusion of the chase.

"The practical American hunter, when not bent on sport for sport's sake, but after meat for food, adopted a much simpler, more direct, and quite as efficacious means of securing his game. This was the method of still hunting, which consisted, as the name suggests, in stealing unobserved upon the intended victim. Generally a small band was preferable. It was not a difficult thing to crawl from the leeward to within sure rifle shot without being discovered. Then, choosing the best concealment the ground afforded, the hunter would commence the work of destruction by firing at the fairest mark. The animals, hearing only the report and seeing nothing, would not flee, but stood still in apparent wonderment. Presently the wounded animal fell, and the companions, smelling its blood, gathered round it and tried to make it rise, and even lick its wounds; or they went on grazing, apparently thinking that their companion had lain down to rest. Meanwhile the hunter's rifle was busy, shot upon shot was heard, and victim after victim fell, until either because there were no more to kill, or because he was surfeited with slaughter, he rose and surveyed his conquest.

"The Buffalo was a difficult animal to kill. A ball upon its shaggy head or neck fell off as from a panoply of steel. Wounds in the nether portion of the body were rarely fatal. It was only in the region of the heart that the blow was sure, and the Indians and white hunters sought out this region in all their attacks. The animal was not ordinarily pugnacious or dangerous, and only when smarting with its wounds would it turn upon its enemy. But its rage at such times made it a formidable adversary, and lucky was the hunter who could keep out of its way."

With the opening of the Northern Pacific Railroad in 1880, the white man joined with the Indian in the final work of destruction; and by February 1883, the great northern herd was also practically annihilated.

Richard Lydecker, in his Royal Natural History, quotes Mr. Hornaday as saying: "The systematic slaughter of the Bisons for the sake of their flesh and hide began in 1830, and the ever increasing demand for "buffalo robes," as the dressed skins were termed, soon began to tell on their numbers; but it was not until the completion of the Kansas branch of the Union Pacific Railroad in 1871 that the great slaughter commenced, which attained its height in 1873; when it is believed that every hide which came into the market represented four Bisons killed." Some idea of the wanton destruction of that time, due to the avarice of the hunter and trapper and the reckless cruelty of the sportsman, may be formed from the fact, that one of the three roads penetrating the southern Bison country carried, in 1873, nearly a quarter of a million skins, more than a million and a half pounds of meat, and fully two and a quarter million pounds of bones.

Referring to the numerical strength of the American Bison in 1866, Catlin in his "North American Indians" says: "The almost countless herds of these animals that are sometimes met with on the prairies have only been spoken of by other writers, and may yet be seen by any traveler who will take the pains to visit those regions. The rutting season, which is in August and September, is the time when they congregate in such masses in some places as literally to blacken the prairie for miles around. It is no uncommon thing at this season to see at these gatherings several thousands in a mass, eddying and reeling about under the cloud of dust which is raised by the bulls as they are pawing in the dirt, or engaged in desperate combats, lunging and butting at each other in the most furious manner, as they constantly are. In these scenes, the males are continually following the females, and the whole mass are in constant motion; and all bellowing is in deep and hollow sounds which mingled together appear like the sound of distant thunder at a distance of a mile or two.

"During the season, while they are congregated together in these dense and confused masses, the remainder of the country for many miles around becomes entirely vacated, and a traveler will spend many a toilsome day, and many a hungry night, without being cheered by the sight of one buffalo. If he retraces his steps a few weeks after however he will find them dispersed and equally stocking the whole country and grazing quietly in little families and flocks. 'A bull in his wallow' is a frequent saying in this country, and it has a very significane meaning for those who have ever seen a bull performing ablutions, or endeavoring to cool his heated sides by tumbling in a mud puddle.

"In the heat of summer, these huge animals, who no doubt suffer very much from the great profusion of their long and shaggy hair, often graze on the low grounds of the prairies, where there is a little stagnant water lying amongst the grass, and the ground underneath being saturated is soft. Into this the enormous bull, lowered down upon one knee, will plunge his horns and at last his head, digging up the earth and make an excavation in the ground into which the water filters from among the grass, forming for him in a few moments a cool and comfortable bath, into which he plunges."

Today the "Buffalo," as the American Bison is generally called, is little more than a memory. Outside of a herd of five hundred "Wood Buffalo" lately reported to have been discovered in New Mexico, there are only two herds of wild Bison in existence on this continent; about twenty head remain in Yellowstone Park, and a herd of about three hundred inhabits the stretch of barren territory southwest of the Great Slave Lake.

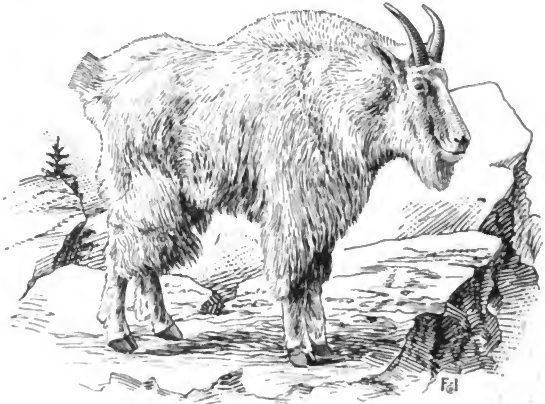
In addition to these there are possibly two thousand Bison living in captivity in zoological parks, and large private game preserves, in different sections of North America; of these, forty-two are at the New York Zoological Park in the Bronx; and thirty-seven are in the twelve square miles of grazing ground, fenced in by the government in the Wichita Forest and Game Preserve, when the New York Zoological Society, in 1906, presented to the United States government the fifteen Bison which formed the nucleus for this herd.

The Bisons breed in captivity about as regularly as domestic cattle, and though inclined to be stubborn, are mild in disposition. The calves are born in May, June and July, and full maturity is reached at the end of the seventh year, when the horns of the male—at first a straight spike—have attained their whole semi-circular curve. Like all thick haired animals in the temperate zone, the Bison sheds its coat in the spring, and does not regain full pelage until October or November.

Contrary to the method employed in dressing cattle, the skin of the "Buffalo" was parted along the spine; the chief articles of commerce obtained from it being the skin, horns, tongue and tallow; for only the choicest parts of the carcass were removed when the animal was plentiful, the great bulk of it being left to rot on the plains.

As far back as 1840, the American Fur Company's agents sent into St. Louis sixty-seven thousand "Buffalo robes," and in 1848 a hundred thousand "robes" and twenty-five thousand "Buffalo" tongues were received at St. Louis; the shipments to New York in the seventies annually exceeded these figures, and the writer distinctly remembers when "Buffalo robes" sold for seven and eight dollars each, and when a good "Buffalo" coat could be bought for from fifteen to twenty dollars. Those who know how common they were at that time, and who are familiar with the durability of the "Buffalo" hide and fur, wonder where they have all gone. No one dreamed forty years ago that the time would ever come when a "Buffalo" skin would be a curiosity, and a mounted "Buffalo" head would be worth from two hundred and fifty to a thousand dollars; but that is the condition of things today.

When we consider that there is really nothing to take the place of the "Buffalo" skin for warmth or service, as well as the food value of the species, it seems a pity that the North-West Breeding Company, organized in 1886, to interbreed the Buffalo with selected native cattle, did not succeed in their undertaking. They appear to have made as complete a failure as the Buffalo Wool Company, formed in Winnipeg, in 1832, to weave the hair of the Bison into cloth.



ROCKY MOUNTAIN GOAT.

HAPLOCERUS-MOUTANUS.

The Rocky Mountain Goat so closely resembles a small American Bison that there is considerable difference of opinion among scientists as to whether it should be classed with the oxen or the goats, and it has been given a separate genus. This animal will weigh as much as the average Virginia deer, and measures about five feet in length, and three feet in height. It has a very short tail, and a dense woolly undercoat, which like the coarse long outer hair, is yellowish white in color. Mountain goats generally occupy grassy belts high up on the mountains in Washington, Idaho and Montana; but it is said that in British Columbia they sometimes come so near to tide water that more than one specimen has been shot from a canoe. They are clumsy looking creatures, but as Dr. W. T. Hornaday says: "they are the most daring climbers of all of the American hoofed animals, and the small, angular, compact hoofs, which are an ingenious combination of rubber pad inside and knife edge outside, hold them equally well on snow, ice or bare rock, so that they can cross walls of rock which neither man, dog, nor mountain sheep, would dare attempt to pass; and thus in spite of their natural stupidity they generally escape from hunters who seek to destroy them, as an evidence of their prowess rather than for any beauty or commercial value they possess."

Dr. Hornaday believes that some of the species of our North American animals were acquired by immigration from the Old World. He says: "It requires no stretch of the imagination to behold Bering Strait choked with the great Polar ice pack, and hardy, strong-built bears, wolves, mountain sheep, and reindeer crossing over the sixty miles that now separate Asia from Alaska, and spreading in all directions over North America. I fully believe that the parent stock of our mountain sheep, caribou, moose, wolves and bears came from Asia by that route." Possibly the presence of the Rocky Mountain Goat on this continent can be accounted for in the same way.

THE MUSK OX.

Possessing the teeth of a Sheep, and the horns of a bull, and intermediate between the sheep and the ox in size and some other characteristics, the Musk Ox (Ovibos-muschatus), is given a distinct genus midway between the two. It is about two-thirds of the size of the American Bison, but owing to its heavy coat of long hairs looks much larger than it really is. Although it has a musky odor, there is no special gland as in the Musk Deer and other musky animals. Both sexes have horns, those on the male being very broad and meeting in the middle of the forehead, from where they curve downward and backward beside the head for most of their length, and then upward and forward. The hair is amber brown, long and fine, hanging down along the sides like that on a merino sheep so as to cover the short tail and upper half of the short, massive legs; but on the shoulders it is matted and curly, giving the appearance of a hump. The hoofs are remarkably symmetrical, the outer half being rounded, while the inner is pointed; the sole of the foot is hairy. The head is massive and the small ears are concealed by the hair, and the space between the nostrils and the upper lip is also covered with short, close hair.

The Musk Ox is fleet, active and hardy, and sometimes makes extended migrations, traveling in bands of a dozen or more. Its present habitat is in Arctic America, north of the sixtieth degree of latitude; but fossilized remains show that it was at one time circumpolar, and that its range on the American continent extended as far south as Kentucky and Kansas. This would indicate that at some time the whole of North America was much colder than it is at present.

The long fine hair of the Musk Ox has at times been woven into fine soft fabrics, but now it is too expensive to be used for that purpose, and at present the skins are only used for robes. The meat of this animal is coarse grained, but juicy and tender, and very palatable if the carcass is dressed as soon as killed so it will not take on a musky flavor.

THE OX.

"Stupid as an ox" is an expression full of meaning when applied to domesticated species of cattle that are only fattened to be destroyed. As Professor David Low says, in his Domesticated Animals of the British Islands, "Nature is sparing of her mental gifts, giving to each creature only that which is fit for its condition." What benefit would consciousness of danger, docility, or the knowledge of what is good for it, be to a creature that only lives to be tied to a stall, or driven to the pasture to be fattened for the slaughter-house?

"The wild Oxen that have never been reduced to slavery, or those who on the fertile plains and in the wilderness have regained their liberty, are altogether different creatures from the apathetic beasts of burden that their domesticated kin have become. They are wary in danger, resolute in defending themselves, and fearless in protecting the helpless members of their herds. When the Hottentots still had a country they could call their own, and were rich in the possession of vast numbers of cattle, chosen oxen guarded their flocks and herds, and protected them from marauders and the Hyaenas and other beasts of prey; and so great was the intelligence of these creatures that while any inhabitant of the Kraal could safely approach their charges, a stranger attempting to do so would have been in great danger of his life. Not only were they taught to be the guardians and protectors of the flocks of their owners, but some of them were trained for war until they caught the spirit of their masters, and in the clash of contending hosts rushed upon the opposing ranks, and trampled the enemy under their feet, and gored them with their horns."

Although Domestic Cattle are all spoken of as belonging to one species (Bos-taurus), instead of springing from one common source, now extinct, there are really many local races, produced by artificial selection from various wild species. The seventeen distinct breeds on the British Islands, many of which have been introduced into this country, are so different from one another that if they were wild animals they would be divided into a number of distinct species; even if the dairy cattle, the beef oxen, and the animals valued for their hides alone, were not each assigned to a separate genus.

Spanish writers say, that the origin of the vast herds of cattle which cover the plains of Paraguay and other parts of South America, can be traced back to several cows and a bull that arrived at the City of Assumption from Andalusia in 1556. Whether this is literally true may be questioned, but it is certain that the European cattle, whatever may have been their original number, multiplied amazingly in their new habitat, and now extend in countless multitudes to the northward from the southern boundaries of the La Plata over a territory stretching from the Atlantic to the Cordilleras. In the beautiful country between the Andes mountains and the Pacific coast the oxen are reared in a state of domestication, but west of the mountains they have entirely escaped from the dominion of man, and are hunted by the Gauchos of the country solely for their hides, the carcasses being left upon the fields to rot or to be devoured by the vultures and beasts of prey.

The Galloway oxen are a polled Scottish breed of obscure origin, but are believed to have been descended from the West Highland Kyloes. They are characterized by their short limbs. The typical color of this species is black, but brown and reddish specimens are frequent. The hair is long and thick, especially in the winter, and the skins of the calves make warm and sightly as well as serviceable coats for men, the main objection to them being their weight, for while they are soft to the touch the skins are thick and heavy. Undoubtedly many of the coats sold as Galloways are made from the skins of other varieties of calves that are probably just as good for the purpose as the one that has been favored by the furriers.

The skins of still-born young cattle of various breeds, known as "Yetta" skins, are sometimes worked up by the furriers into coats and even suits for women, but cattle are chiefly prized for their food value, and the various bi-products that are obtained from different parts of the body. The skins or hides are mainly used for making leather.

THE CAMEL.

Many portions of the Orient would be uninhabitable but for the single-humped Arabian Camel or Dromedary and the Bacterian Camel with two humps, now known only in their domesticated state; for they are not only "the ships of the desert," but the source to which the natives look for their supply of milk, flesh and hides, and the hair which is a valuable article of trade.

Much could be written about the ability of these animals to carry great burdens, and to travel many days without drink, because of the reserve supply of water they can carry in their peculiarly constructed cellular stomachs; but our present interest is with the representatives of the Llama genus of the Camelidae family sometimes called Cameloids. The Camelus however seems to be the one genus that has gone on through the centuries without changing from its original form, but is the same today as it was before it bore the "Wise Men of the East" across the desert with their gifts of gold, frankincense and myrrh.

The Alpaca is so closely allied to the Llama as to be regarded by some as a smaller variety of that animal, rather than a distinct species. It exists both in a domesticated and wild state, and is found in its native state in the Andes Mountains, especially in Chili and Peru. It has a longer neck, but otherwise resembles the sheep in form as well as size although it belongs to the Camel family. The long, soft wool of this animal, which is straighter than that of the sheep and very shiny, is woven into beautiful silky fabrics, but most of the fabrics sold as alpaca today contain little if any alpaca, being made of a mixture of cotton and different wools.

The Llama (Lama-peruana) has an extremely long neck, and stands from three to four feet high. The dense hair of the adult is long and coarse, but that on the young Llamas is soft and silky. Its wool is used to some extent, but in Peru; where it is most abundant, the Llama is used by the natives as a beast of burden. The usual color is white, black or brown; the legs being black on both the black and brown varieties.

The Vicuna (Lama-vicugna), sometimes called the Vicuna Sheep, is another representative of the Camel family found in South America, principally in the southern portion. The Vicuna is a light fawn color with a white belly, and has a short tufted fawn colored tail. The wool is long and thick, with longer hairs projecting through it at intervals, and is well adapted for the manufacture of woolen cloth; the skins of the Vicuna being soft and light would be used for sleigh robes to a greater extent than they are if they were less expensive.

When the Vicuna stands with its two and a half foot neck extended it measures about six feet from the head to the ground. It is generally hunted by horsemen with bolos.

The Guanaco (Llama-huanacus), the most valuable animal of the Lama genus, is as stupid as it is interesting. It is so incapable of defending itself that the natives of Terra del Fuego, slaughter Guanacos for food by surrounding groups of them and simply clubbing them to death. In size it is between the Llama and Vicuna, standing about four feet at the shoulders. The thick, woolly hair is a pale reddish brown or fawn color, but there are naked patches of skin on the legs.

The Guanaco is a quaint animal, and probably really belongs in the same species as the Vicuna. It has a peculiar cry, between the belling of a deer and the neighing of a horse. It is very abundant on the Patagonian plains, where its two principal enemies are the Patagonian Indians and the Puma, as it is the principal food of both. The skin is also of great value to the Patagonians, as their long robes are made from it. In commerce it is chiefly used for sleigh robes, but in this day of artistic improvement there is no telling under what name or in what guise it will appear next.

THE ANTELOPE.

The only representatives of the Antelope family, with its many beautiful, curious and interesting species, that can by any stretch of the imagination be brought within the scope of this work are:

The Indian Antelope (Antilope-cervicapra), whose skins are occasionally used by furriers for various purposes; **The Spring-Bock** (Gazella-euchore), which is found in Southern Africa, and whose skins make good glove leather; **The Gnu, or Wildebeest** (Connochoetes-taurina), the quaint South African animal, with the hoofs of a stag, the head of a bison, the horns of a buffalo, and the tail of a horse, which was once sought for its hide, but is now only valued because it can be broke to the plow; and **The Chamois** (Rupicapra-tragus), which lends its name to the skins sometimes used by furriers for intermediate linings, and the pockets in fine garments.

None of these are of sufficient importance commercially to call for extended mention here, unless it may possibly be the Chamois, which, to quote from the Official Guide to the New York Zoological Park, "has its home in the mountains of Southern Europe, especially the Pyrenees, the Swiss Alps and the Caucasus; and is the animal so often pictured as leaping from crag to crag, across chasms **apparently** two hundred feet wide; but it is not exclusively a crag dweller, for in many localities it inhabits the mountain forests. Like most other mountain ungulates, the Chamois dwell high in summer, and in the winter they seek lower and more sheltered situations. They are exceedingly wary and agile, and sure-footed on dangerous ground."

The Chamois are about three feet long, and have small almost vertical horns that turn backwards and down at the tips.

In beauty the **Sable Antelope** (Hippotragus-niger) of Africa, surpasses all other species. Some claim, however, that the purple and white **Blessbok** (Bubalis-albifrons), that seems to have about disappeared since the Boer War, was its superior in this respect, even though it lacked the impressive presence and the intelligent air that together with its shapely horns and glossy black and white coat, make the Sable Antelope conspicuous in a family noted for the grace and beauty of its representatives.

SABLE ANTELOPE

All Antelopes have true horns and with the exception of a single species belong to one family. **The Prong-Horn Antelope** (Antilocapra-americana), now rapidly becoming extinct, is the only animal possessing a hollow horn with a prong, and the only hollow-horned animal that sheds its horns each year. It also lacks the "dew claws" possessed by all other ruminants, and has long tubular hair on the neck and body, that is erectile on the rump. Its horns are placed directly over the eyes.

THE DEER FAMILY.

There are many species of deer. Strictly speaking none of them are fur bearing animals, but some of them are noticed here because they are as familiar to most of us as the Dogs and Cats that are the household pets in so many homes. They are of commercial importance on account of the value of their horns, hair and hides, the service they can be trained to render to mankind, and the food with which they supply him; to say nothing of their effect upon subsidiary wild life, or the use the natives of their various habitats make of the skins of the deer for clothing and other purposes.

The East India Deer (Cervus-axis), whose antlers are used in the manufacture of knife handles and whose skins make excellent leather, are sometimes used by the furriers in making foot muffs. It is an abundant animal, which inhabits India and Ceylon. It is a beautiful and graceful creature with numerous white spots upon its light brown coat which on the belly change into white lines.

It is characteristic of the axis, which in India is also known as the chital, that the three points on the antlers are thrown forward, with the exception of the second tine which points backwards. It is generally found among bushes or trees in the neighborhood of water, and in bamboo jungles, either on the plains or at an elevation of three to four thousand feet. The Axis are gregarious and good swimmers, taking readily to the water.

There is great variation as regards the pairing season and the shedding of antlers, bucks with fully developed antlers, and young fawns, being met with at all seasons.

The Fallow Deer (Dama-vulgaris) is the best known of all the deer family. It is found in the greater part of Europe, and has a light brown body spotted with white. The inside of the legs is a beautiful fawn color, and the black tail is tipped and edged with white. In some specimens, that have no white markings on the tail, the legs and points are brown and the general color of the body is almost black. The Fallow Deer is larger and heavier than the Axis, and has a short, well formed head with full round nose and expressive eyes. The antlers are rather palmated at the top and are usually turned backwards. The antlers are shed in April, and the bucks get rid of the velvet on the new ones in August, by striking them against the branches of the trees. The pairing season is in September, and the does bring forth one or two young in May. This is the species usually seen in zoological parks.

The White Tailed Virginia Deer (Cariacus-virginianus), was formerly widely distributed through North America, and is still found in Montana and Alaska. It has short bristly hair of a light grey color, sometimes marked with small spots, especially on the hind quarters. The antlers have an abundance of points and are small, branched and curved abruptly forward.

The skins are used largely in the manufacture of leather leggings.

The Black Tailed or Mule Deer (Cariacus-marcrotis), is another North American species and derives its name from the length of its ears. It is larger than the Virginia Deer, and its color is reddish brown. The principal habitat of the Mule Deer is from Montana north and west to the Pacific coast. Its skins are largely used by German leather manufacturers.

The Red Deer (Cervus-elaphus), inhabits France, Germany and Norway, and is still occasionally seen in the British Islands, where it was at one time very abundant and extensively hunted. Next to the Wapiti, the European Red Deer is the finest living deer in the world. The stags are of a brownish red color, with a dark mark along the center of the back, and dark brown legs, and whitish or light brown tail and buttocks.

The head of the stag is beautifully formed and pointed, and has a lighter shade of color around the under jaw and the large expressive dark brown eyes; the hind is lighter in color and weight than the stag, and has a more pointed nose. The hinds usually consort with the stag in the second year, and, as a rule, produce but one calf at a time. The young ones remain with the hinds until they are nearly two years old, although they are, of course, able to take care of themselves much earlier. The pairing season begins in October and the period of gestation is about eight months. The calf at birth is white spotted like a fallow deer, and remains so for the first three or four months; after that the spots gradually disappear and the true color of the Red Deer asserts itself.

The male sheds his antlers in March, and the new ones begin to grow in April; as is the case with all deers he eats freely while they are developing, and by the time new antlers are complete and hardened in September he is very sleek and fat. He does not long continue so, for during the rutting season when many fierce combats occur between the males he does not eat and becomes very thin.

Until the stag is full grown, which is in ten years, the points on the antlers increase year by year.

The skins of Red Deer make excellent leather, and the antlers are used in the manufacture of knife handles, etc. In ancient times the antlers were used as picks and hammers.

TRUE HORNS AND ANTLERS.

Antlers are worn by the female cariboös and nearly every male member of the deer family, and usually have several branches. They are solid modifications of true bone grown from the skull, that are shed every year and quickly renewed. They are of all shapes and sizes, from the simple spikes of some species to the immense branched or palmated antlers of the stag, elk or moose. During growth they are covered with a velvety tissue that is furry outside, and abounding in blood cells which afford a copious supply of blood to the rapidly enlarging osseous tissue. When the antlers are fully developed the vascular activity of the velvety tissue ceases, and the velvet shrivels and peels or is rubbed off by the animal. The old antlers are usually shed in March, and the velvet disappears from the fully developed new antlers just before the mating season in August or September.

In the first year a stag has only frontal protuberances; in the second a simple stem or snag, called a spike; in the third year a larger stem with one branch, called the brow antler, is developed. The bay antler is produced the fourth year, and the royal antler is acquired in the fifth year. After that the horns of the stag become more or less palmate, with diverging points. The main stem of a branched antler is called the beam, and the branches, exclusive of the mere points on the palmated part, are called tines.

Horns, as before stated, are hollow sheaths growing over bony cores, and except in the case of the prong-horn are never shed. They are worn by both sexes of most species of Bison, Buffaloes, Cattle, Antelopes, Sheep and Goats. True Horns arise from the frontal bones of the skull.

THE WAPITI.

The Wapiti (Cervus-canadensis), the largest Deer on the globe, exists only in North America, where it is often erroneously called the Elk. Large herds of this animal formerly ranged throughout the continent, but it has become reduced in numbers, and its range has been restricted. Now it is seldom seen anywhere except in Washington, Oregon, California, Montana, Wyoming, and on Vancouver's Island; the largest herd remaining outside of the Yellowstone Park, being found in the Olympic Mountains in Washington and on the mountains on Vancouver's Island.

The Wapiti stands from five to six feet high, and although large males sometimes exceed a thousand pounds in weight, the usual weight is about seven hundred pounds, and full grown females often weigh less than four hundred pounds. The color is dark brown on the head and neck, a creamy grey on the back, flanks and sides, and black on the under parts of the body. The legs are brown, and there is a light patch bordered with black on the buttocks.

The full grown stag is really a magnificent creature, symmetrical in form, and remarkable for the graceful ease with which he carries the immense antlers. These sometimes attain to a length of sixty inches and over, and in the fifth year develop five points each, but after that period the number increase irregularly so that in older animals there are often more snags on one antler than the other. The hinds are smaller and lighter in color than the males, and have a more pointed nose, and fine, large, plaintive eyes. The young are born in May, a single fawn usually being produced at a birth, but occasionally two appear.

The general habits of the Wapiti are very similar to those of the Red Deer to which scientists say it belongs. The old stag lives apart from the main herd during the greater part of the year; and in the pairing season after having vanquished his rivals in a fight takes possession of a party of hinds. At the breeding season the Wapiti desert the lower hills to take refuge in the higher ranges, getting as near as possible to the snow line without leaving the upper belt of the forest. The hinds leave the herds, and the fawns are born in the most secluded thickets. The antlers are shed late in December or early in January, and the new antlers begin to sprout in March or April, and are complete by August. At this time the call of the old stag has such a resemblance to the bray of a donkey that the old traders in the Rocky Mountains called it the "Jackass Deer."

Unlike most of the Deer the Wapiti do not feed at night, but eat during the day, very much after the manner of the Moose; but they are not particular as to what they eat, consuming the coarsest grasses and weeds as freely as the leaves and tender shoots of deciduous trees. In the winter, when they are pressed for food, they will even gnaw the bark off the trees.

The skins of the Wapiti are used for leather, and the antlers for ornamental purposes. The antlers are worth from twenty-five to seventy-five dollar a pair.

THE MOOSE OR ELK.

(Alces-machlis)

The distinction between the Moose and the Elk is one of locality and not of species. The Elk of the Old World and the Moose of the New are so similar in formation, nature, distinguishing characteristics and habits, that in considering one we get a perfect description of the other. Long before the Moose was discovered in America, the Elk was hunted in every part of the British Islands, the continent of Europe and Northern Asia; but it is rapidly diminishing in numbers, although it is still found in Norway and Sweden, Eastern Prussia, and in parts of Russia and Siberia.

The Moose is valued by the hunters and trappers principally for its flesh and horns, as its hide is inferior to that of other wild animals. It is the largest living representative of the Deer family, and is characterized by the length of its limbs, its short neck, long flapping ears, and the length and narrowness of its head, the ungainly aspect of which is greatly increased by the large nostrils, and the large hairy overhanging muzzle. The front legs are considerably longer than the hind ones, and as the Moose stands six feet from the ground at the shoulder it cannot, owing to its short neck, feed from the ground, but subsists on shrubs, and the leaves and tender branches of the trees.

In his description of the Moose, Richard Lydecker says: "The antlers, instead of emerging from the forehead at an acute angle with its middle line, and inclining forward, as is the case with all living representatives of the genus Cervus, project on either side at right angles to the middle line of the forehead and on the same plane as its surface. Their basal position consists of a short cylindrical beam without any tine, and beyond this beam they expand into an enormous basin-like palmation containing snags on the outer edge. The antlers of a fine specimen may weigh as much as sixty pounds, and have a span of sixty-five inches, a length along the palmation of forty-one inches, and a ridge across the same of forty-eight inches." The antlers of the male do not attain their full dimensions until the ninth year. The female and the yearling male show only knobs an inch high. The tail of the Moose is a mere rudiment, and the feet have large and shapely pointed hoofs.

The bull Moose is much larger than the female, and has a hair-covered appendage on the throat, formed by the dilatation of the skin, varying from four to ten inches in length.

The Moose is found throughout Canada, and in Maine and Minnesota and the northern part of the Rocky Mountains. The Alaskan Moose of the Yukon Valley is undoubtedly the largest form of its genus, and has lately been classed as a separate species (Alces-gigas).

The Moose feed from early dawn till sunrise, when they repose till ten or eleven o'clock; then they feed again till about two, when they take another resting spell until four or five o'clock, after which they feed until dusk, when they lay down for the night. In summer they are solitary in their habits, wandering alone in the neighborhood of swamps, rivers or lakes; but in winter they gather in small parties in what are termed moose yards, which are always located in some part of the country where there is an abundant growth of deciduous trees such as white birch, maple, poplar and mountain ash, which with the shoots of the evergreen, balsam fir and juniper, form the diet of the moose.

The antlers of the Moose are shed during January, and the new pair are fully developed by August. The hair of the Moose is coarse and with the exception of the yellowish legs generally of some shade of brown, but during some seasons and at certain ages the pelage may be of a greyish hue. The favorite pace of the Moose is a long, swinging trot. The slaughter of these animals when imprisoned in their yard in winter is prohibited by law. The three legitimate methods of capturing them are: stalking or still hunting, fire hunting and calling.

THE REINDEER OR CARIBOU.

The word Caribou applied to the American Reindeer, is a contraction or corruption of the name "caire boeuf"—square ox—given this animal by the French Canadians when it was first discovered in America.

The Woodland variety (Rangifer-caribou), which stands about four and one-half feet at the shoulders, and weighs from three hundred and fifty to four hundred pounds, is found in Labrador, northern Canada, Maine, Minnesota, northern Idaho and Montana, Oregon in the neighborhood of Mt. Hood, British Columbia, and southern Alaska to the head waters of the Yukon River. It is twice the size of the barren ground Caribou (Rangifer-groenlandicus), whose habitat in the summer is confined to Greenland and the barren arctic wastes north of the forest regions of North America, but which in winter makes extensive migrations into the territory of the Woodland Caribou, but even when living in the same district the two species do not intermingle.

In its wild state the Caribou, like the European Reindeer (Rangifer-tarandus), lives on mosses, leaves, grass and aquatic plants, its great resource being lichens. Like the European variety, the American Reindeer is an animal of great speed and endurance, "frequenting marshy and swampy grounds, and loving ice-covered lakes and ponds as much as any boy." Caribous are so shy they are difficult animals to stalk, but they can be easily killed by the hunter who, taking advantage of the wind, shoots as they pass along on their migrations, when they travel in herds and are not as shy and wary as when wandering singly.

But little is known about the breeding habits of the Reindeer, though it is understood that the "barren grounds" Caribou pairs in winter, and the Woodland species in September. The antlers of the bucks are shed in December, but the small antlers with which the does are provided do not fall until the spring. The fawns are produced in May, and are either one or two in number.

The Reindeer is invaluable to the inhabitants of the Arctic regions in Europe, Asia and America. It was formerly abundant in Scotland. In Norway there are still thousands of domesticated reindeer on the farms, the males being harnessed and used for sledding and draught purposes and the females yielding an abundance of milk. The domesticated breed, which is smaller than the wild race, is also found in Siberia and Lapland. The flesh of the Reindeer is excellent eating, the tongue and kidney being considered great delicacies.

The Old World Reindeer (Rangifer-tarandus), stands from three to four feet high, and is buff or brown in color, lighter on the belly and head than the back; in Labrador it is almost white, and pure white specimens are met with in Lapland. Mottled animals are sometimes seen in Russia. The hair is abundant, bristly and brittle, affording an excellent protection from the arctic cold, and its broad feet enable it to walk with ease on the snow. The antlers are peculiar and vary in formation, no two pair being alike, but they always curve forward, and usually consist of two branches radiating into many points. The majority of the males have a brow antler, which is a triangular piece of bone shaped like a spatula and hanging over the nose, and it is claimed that they use this antler to scrape the snow away from the moss on which they feed. The females have antlers as well as the males.

The hair of the Reindeer is said to have floating qualities superior to cork, and life belts and buoys are sometimes made of it. The Eskimos make coats and sleeping bags, which are both light and impervious to the cold, from the skins, but in Europe they are generally used for leather.

In Russia, the skins of the younger animals are made into linings, called Pijiky, which are light, warm and durable.

THE GOAT FAMILY.

Goats do not generally range as far north as the sheep, but they live at higher altitudes and incline to the steep cliffs and mountain regions, where their remarkable climbing powers enable them to speed where other animals could scarcely get a foot hold. They connect the antelope with the sheep, which they approach so closely in their internal organization that many authorities believe that they should be considered as belonging to the same family, although they are of widely differing natures and appearance.

The Goat even when enslaved is restless, bold and independent, fearlessly facing the enemies who assail it, and is always familiar and capricious, wandering at will away from its fellows to seek the crags where the shrubs it craves are to be found.

Goats all have hard callosities on their knees, short tails, hairy muzzles, and a more or less distinct beard upon the chin of the males, who are further characterized by a strong odor. In the few cases where foot glands are present they are found only on the forefeet. Both sexes have horns, those of the males rising close together on the head above the plane of the forehead, and growing upward and backward to a considerable length, but seldom showing the spiral twist which is a characteristic of the horns of all sheep except the Ovis-tragelaphus. Goats show no gland pits in the skull below the eyes, and the outline of the face instead of being curved like that of the sheep is straight; like the latter they are covered with a mixture of wool and hair, but in the sheep the wool forms the essential covering for the body, while in the goat the hair predominates.

All wild goats are frequently spoken of as **Ibexes,** but that name rightly belongs only to the few species with long, flat, mottled scimetar-like horns, dwelling in the Himalayas, and on the higher mountains of South Eastern Europe, Syria, Arabia, and Abysinnia. The Ibexes all have a uniform coloration, varying with age and the season from a grizzly grey to various shades of brown, the color always being lighter on the throat, belly and the inside of their legs than elsewhere. They pair in midwinter, and the young, two at a birth, are born in the early summer. The type species is the Alpine Ibex (Capra-ibex).

With the exception of the Caucassian Tur, and the Spanish Capramontes, all the different races of **True Wild Goats** are confined to some of the mountainous regions of North Western Africa, and Central Asia. They are strong, agile and sure footed animals, preferring the leaves and small branches of shrubs for food to the richest pasture.

At one time the Ibex was believed to be the ancestor of all the many breeds of common goats, and later scientists claimed that the **Pesang (Capra-aegagrus)** was the wild stock from which the type representatives of the domesticated goat were descended; but the probability is that the common goats were derived not from one but from a number of wild species; for not only do goats of different countries differ from one another, but there often exist in the same country, and under the same climatic and food conditions, races so divergent that it is impossible to believe that they have come down from the same stock. "The Black Syrian Goat, with its convex face and udders hanging to the ground, is as different from the other domesticated goats of that country as the Jackal is from the Wolf; and the little goats from the coast of Guinea have been acclimated in America for more than a hundred years, without making the least approach to those carried to the same country at different times from Europe."

There are several varieties of the **Angora Goat,** which is noted for the length and quality of the soft silky white hair which covers the whole of the body and the greater part of its legs, and which is of much more value to the manufacturers of fabrics than the short coarse under wool which is beneath it. Some of the skins are used by furriers to make children's sets and baby carriage robes; and at times there is also a demand for Angora fringe or trimming, either dyed or in the natural glossy white color. During the cold season Angora Goats are kept in stables, but throughout the rest of the year are allowed to roam at large in immense herds, each buck being accompanied by about one hundred ewes. They are shorn in April. This species is believed by some to be a direct descendant of the **Wild Himalayan Markhor** (Capra-falconis), which is distinguished from all other goats by its upwardly directed, spiral twisted, horns, and the great extension of the beard on its throat and shoulders. The Markhor stands about three feet and a half high, and is reddish brown in summer and grey in the winter. Its beard always being black in front and grey behind.

The Cashmere or Tibet Goat, is distinguished by its delicate head, long, wide half pendulous ears, and slightly spiral erect horns which in some cases incline inward to such an extent as to cross. In this animal it is the under wool that is of commercial value, being used in the manufacture of shawls and certain kinds of cloth. This wool falls off at certain seasons of the year, when it is removed from the body of the animal with combs, the long hairs being undisturbed.

Goat raising is an important industry in different parts of the Chinese Empire, and hundreds of thousands of Chinese Goat skins are worked up by furriers annually into rugs, robes, coats and other articles of fur wear. The main objection to goat skins is their odor, which however is not so noticeable in the skins of the females and of younger animals. Only the skins of the very young are shipped in their natural shape, the others being sewed into crosses and rugs before they are baled for export. **The Chinese Goats** show considerable variation in color, but grey predominates. A large percentage of the skins are dyed black before being used, and some of the still-born kids are hard to distinguish from Moire Astrachans when they come from the dyers, but where there has been any growth it is generally easy to detect the goat, no matter what name may be used to hide its identity.

The skins of many varieties of goats that cannot be used by the furriers make fine leather, especially those from Morocco; and there is a demand everywhere for kid skins for the manufacture of gloves.

THE HORSE.

Horse is a word often applied to any member of the type species of the Equidæ family without regard to sex or age; but strictly speaking the adult male Horse should be called a stallion; the matured female a mare; the female foal, a filly; and the male foal, a colt. Pony is a general term for all small horses, and a gelding is a castrated male horse.

The Horse was probably first domesticated in Asia, long before it was historically mentioned in Egypt nineteen hundred years before Christ. The original wild representative of the species which was at one time found in all parts of Asia and Europe, was of a uniform yellowish grey color, much smaller but stronger than the breeds that have been descended from it.

It is hard to believe that the single-toed slender Arabian steeds, huge draft horses and diminutive Shetland ponies all trace their origin back to a common several-toed ancestor scarcely larger than a fox, and presenting few of the features that have since made the Horse the most remarkable of all quadrupeds. It is evident that there must have been a sustained effort all through the centuries to increase the size of the species by artificial selection, and the different structural characteristics referred to are probably largely due to difference in food and climate. In the moist temperate regions where the herbage is rank and plentiful, the speed which is the characteristic of the breeds reared in hot dry southern countries where food is scarce, gives places to strength; and powerful draught horses are just as natural a result in Flanders, as racers are on the Arabian deserts. The smaller relative size of the Norway, Iceland and Shetland ponies is due entirely to the colder temperature of their habitat.

Horses quickly adapt themselves to new conditions and circumstances, and can be readily tamed and broke, but it is an interesting fact that if turned loose they will revert to their wild or natural state as quickly as they were domesticated. This probably accounts for the immense herds of half-wild ponies that range the Kirghiz Steppes, and other portions of Asia.

The brain of the horse is small, but all the members of the family are noted for their sagacity, intelligence and tenacious memories; while their timidity, desire to be first in a race, their conduct on the battlefield, their resentment of injury and appreciation of kindness, all show that their emotional nature is also highly developed.

It is now generally conceded that the Tarpans of Asia, like the mustangs of the North American plains, the Cimarans of South America and the Brumbies of the Australian Bush, are the descendants of reverted domestic horses, and that the only living wild horse today is the Equus Prejevalsky of the sand deserts of Central Asia, and there seems to be a question as to whether that is a valid species of the true horse, or an intermediate between the horses and asses. In either case it is of little value from a commercial or utilitarian standpoint.

Of all the various species of partly or wholly domesticated horses in different parts of the world, only one variety has any value as a fur-bearing animal, and it was less than ten years ago that furriers began to recognize the beauty of the moire marked skins of the foals of the so-called Russian ponies. These hardy animals, resulted from the mixing of escaped domestic horses with the Tarpans, and in spite of the way the young have been slaughtered by the Kamuck and Kirghiz tribes, so that the milk of the mares could be secured for the manufacture of Koumyss, they have multiplied until it is estimated that there are now over 10,000,000 of these animals on the 850 square miles of sterile, stony and streamless plains or Steppes between the Volga, Chinese Turkestan, the Alutan Mountains and the Caspian Sea, and that the marketing of upwards of 200,000 skins annually the last few years, while it has been a source of revenue to the nomadic tribes who sold them has in no way threatened the destruction of the herds.

At first the skins were used almost entirely in their natural state for automobile coats, but when it was discovered that they would take the black dye so as to look like broadtail, pony coats for all kinds of wear became so desirable and popular that for a time the skins trebled and quadrupled in value, and for some years the natives killed the foals immediately after birth, sparing only the number necessary for the proper conservation of the species. The result was an increase in the supply, which caused a decline in the price of the skins of the "Kirgisenpferd," as it is called by the Germans. The color ranges from a clear white to a rich blue-brown; the hair on some of the skins being as flat and silky as the finest broadtail, and on others as shaggy and harsh as the coarest astrachan.

In the Equidae family are included besides the Horse, the now extinct **Quagga,** which scientists claim was the connecting link between the horse and the Wild Asses, the Zebra and the Tapirs. **Wild Asses** are found in Asia, Syria, and Africa; the African species being the ancestor of the domestic breeds. Sir Samuel Baker said: "Those who have seen donkeys only in their civilized state can have no conception of the beauty and courage of the wild and original animal. It is the perfection of activity, has a high-bred tone of deportment, and a high actioned step, when it trots freely over the sands with the speed of a race horse galloping over the boundless desert."

Zebras were once very numerous, but are now reduced in numbers, and found only in Africa south of the Sahara Desert. They stand about four feet high, have short manes and a creamy white ground color marked with broad brown or black stripes.

The Tapir, which is often spoken of as the ancestor of the horse, is one of the most ancient of the odd-toed ungulates. All of the living species are included in one genus—(Tapirus), and with the exception of one variety found on the Malayan Peninsula, they are restricted to the forest regions of the Andes Mountains in America, but at one time they were also spread over the Northern Hemisphere. With the exception of the Malayan species, which is white on the middle of the body, all Tapirs are uniformly black when adult, but the young are all spotted and striped with white. They are shy, harmless, nocturnal animals, living near the water in which they delight to swim.

THE SHEEP FAMILY.

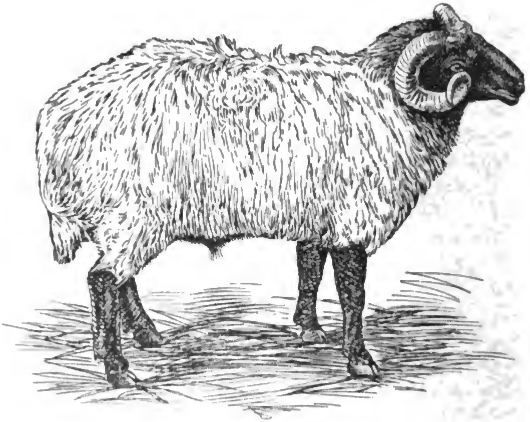
No animal is of greater service to mankind than the Sheep. Poland rightly says that what the American Bison was to the North American Indian, and what the Reindeer is to the Laplander, the Sheep is to all the inhabitants of every portion of the world. Clothing, and lanoline and other by-products, are made from its wool; gloves, shoes and innumerable useful and ornamental articles are made from its skin, and nearly every part of its body is used for food.

We are told that the **Persian, Astrachan, Ukrainer** and other sheep producing the tight curled lambs, whose skins are becoming more and more valuable every year, are the result of crossing the native sheep of the various sections indicated by the names applied to the different lambs, with the Karakule and Arabi Sheep of the Asiatic desert; but the word Arabi is a general rather than a specific term, and Karakule is a designation applied to all grade fur producing desert sheep, rather than to any particular species. The literal meaning of the word is Black Lake, the name of the place where the Russian traders first went to buy Sheep from the herders of the Bokhara Desert.

Dr. C. C. Young of Belen, Texas, a breeder of Arabi desert Sheep, who recently made a hazardous trip to the land of the Persian Lamb, says: "The Tartars call the producer of any valuable fur-bearing sheep Arabi. Arab in Tartar means black, and it is supposed the name originated from this source. as the word and the Sheep are unknown in Arabia. The small **Arabi (Ovis-patyura)** is practically extinct, and the one this country has been getting most of its skins from for the last fifty years is the large Sheep known as the Doozbai.

"When mature, all of the breeds have black, lustrous hair on the legs, tail, abdomen, face and head; so I decided that the origin of them all must have been a black animal with a powerful, persistent strain, which had carried its black pigment down through generation after generation. After a hunt through the traditions and histories of the country, a talk with the special Ambassador of the Dalai Lama of Thibet, and conferences with a representative of the Emir of Bokhara, a trip to the very borders of Afghanistan and a careful search through desert wastes, I found the origin of the first Persian Lamb.''

''Many years ago there were neither Karakules, Arabis or Doozbais in Bokhara; but they had a small Black Sheep with a wonderfully lustrous fur, and which for some time after birth was covered with uniform curls. There was little demand for the fur, and what was used was purchased by the old monarchs of Europe and Asia.



ARABI RAM

''As the demand increased these little Black Sheep, known as the Danadar, were crossed with the Koordiuk, an immense fawn colored desert-roving Sheep, giving us the Doozbai with its beautiful and much tighter curls than those of the Danadar. The smaller Arabi resulted from a cross between the Danadar and a small animal known as the Gray Kooldiuk. From these have descended the breeds which now produce the Persian Lamb.

"It is said that there are a few specimens of the Black Danadar left in Khiva, but my search in that country failed to produce any. Chambo Tshorze, Ambassador from the Dalai Lama, told me there were some Danadars in a valley near Lhassa in Thibet, but that they were very few."

For several years the government has been making tests in Washington, D. C., which have substantiated the claim advanced by Dr. Young, and other sheep breeders in the Southwest, that by crossing some of our domestic longwool breeds like the Lincolns, Cotswolds, Lestershires and Dartmores with the strains of the Arabi, or broad tail Sheep of the Bokharan desert, a fur is produced that is vastly superior to that of the Persian and other Asiatic Lambs for whose skins the American people are spending millions of dollars annually. Dr. Young, in writing for the Fur Trade Review about his experiments along this line, says:

ARABI EWE AND LAMB.

"In texture some skins produced by us at Belen and Conutello, Texas, show an unsurpassable quality, notwithstanding the poor pasture that we were compelled to graze our Sheep on; and I have no hesitancy in predicting that the dry West and Southwest will in time revolutionize the

Sheep fur industry, for it was no trick for us to produce skins valued at from eight to twelve dollars in a raw state. As good nutrition means luster and tightness of curl, still better results can be obtained in the Northern and Eastern States, on account of the excellent pasture and the very nutritious hay that can be secured there."

When we consider that owing to the lambs being killed so soon after birth the ewes can safely be allowed to lamb twice yearly; that the dead lambs lose none of their meat value, and that the skins of prematurely born lambs often bring fabulous prices, it is easy to see that the profits to be derived from a proper prosecution of this industry will be large.

While the best results were obtained by Dr. Young in the first cross of Arabis with domestic long-wools, the tight-wool strains, like Merinos, Shropshire, Ramboulets, etc., have to be bred to the Arabis two or three times, before producing skins equal in quality to those secured from the first cross with any of the different varieties of our long-wool sheep.

The great obstacle to the prosecution of this industry, is the almost unsurmountable barrier placed in the way of bringing live Arabi stock into this country, because of the rigid quarantine the Department of Agriculture has established against the entire continent of Asia, on account of the existence of surra in Southwest India, and the Maltese fever in the Maltese Islands.

Much that has been written about the killing of the mother to secure the skin of the unborn Persian Lamb is pure fiction, but it is true that in all the grades and crosses of the Arabi Sheep it is necessary to kill the Lambs shortly after birth, in order to prevent the curls from losing their tightness and luster, and even their color. The black pigment soon oxidizes and turns brown, and in eight or ten months becomes grey, which is the natural color of all mature fur-producing Arabi Sheep. The grey wool of the mature Arabis, as well as that of all grades produced from these animals is very coarse, and admirably adapted because of its great length for the weaving of rugs. Some of the most beautiful Persian and Bokharan rugs are made from it.

The name Persian as applied to lambs is misleading. As we have seen most of the skins so designated still come from Bokhara and the surrounding country. It is the Shiraz, and some of the other grades, that come from the provinces in Persia from which they derive their names, that are strictly speaking Persian skins. The word Persian, therefore, seems to indicate quality rather than locality, and is applied to certain grades produced from different strains of the Patyura, and other Arabi sheep, whether they are obtained on the Bokhara desert or in Texas.

The Krimmer or Crimean Lamb derives its name from its habitat—the Crimean Peninsula. While the Astrachan, Persian, Ukranier and other Russian and Asiatic lambs are generally born black, this variety usually comes into the world with a grey or slate colored fur that shows considerable variation in the character of the curl. Krimmer is always more or less in favor for children's furs, and sometimes is used for trimmings, caps and capes.

Iceland Sheep have a long, beautifully curled wool, and the white specimens are sometimes sold for Tibet lamb, but they can easily be distinguished by the dense underfur. The predominating colors are white, black, brown and mottled; but bluish grey, and black or brown spotted animals are sometimes met with. This breed is conspicuous because of the number of its horns. It is said that the sheep are not shorn in Iceland, but that the wool is pulled off the animals as it becomes loose late in the spring.

China Sheep are generally coarser than the Iceland sheep; some, however, have almost as fine wool, but the hair is always shorter and the curl is smaller.

Slink Lamb is a name given to the skins taken from the stillborn of the domesticated varieties of sheep, or those who die or are killed soon after birth. These skins are used principally for glove and shoe linings.

Sheep are the stupidest as well as the most harmless and timid of all animals. They are nearly allied to the Musk Ox by which they are connected with the Bovidae, but in the **Barbary Sheep of Africa** (Ovis-tragelaphus) and the **Bharu, or Blue Sheep of Tibet** (Ovis-nahura), they approximate nearer to the goats; in the character of their molar teeth they so strongly resemble the gazelles that some authorities think that they may be descended from some extinct family of antelopes.

The strongest instinct in both wild and domesticated sheep seems to be an inclination to seek the highest altitudes; even in a level country the lambs will congregate and contest for the possession of the highest knolls, and the aged sheep seem as anxious to secure the most elevated spot in the pasture field where the flock folds for the night, as the lambkin that can hardly support itself on its unsteady legs.

In summer sheep feed in flocks and graze very closely; in the winter they are penned, and fed on hay, turnips and other vegetables. They are extremely liable to a very infectious foot and mouth disease, and for this reason most countries establish a rigid quarantine against the introduction of foreign sheep. The lambs are generally born in January and February, and are frisky and frolicsome creatures.

The adult males are called rams, the females ewes, and the young are known as lambs. Both males and females are furnished with horns; those of the former being large and massive at the base, triangular in section, and curling upwards and backwards, and turning outward from the side of the head. The horns of the females are small and narrow. The largest sheep are smaller than most oxen, and while their necks are comparatively short they carry their heads higher above the level of the back. A distinctive feature is a small gland between the hoofs on each foot.

Domesticated sheep are all classed as one species (Ovis-aries), and are found in vast numbers in every part of the world. Sheep washing and shearing has been practiced from time immemorial. While only a few breeds are fur producers, the raising of sheep for wool is an important industry in many lands, particularly in England and her colonies. The Lincoln and Leicester sheep have the heaviest fleeces, but the wool of the various Scotch, Welch and Devonshire breeds is particularly fine, and that of the super Southdowns is claimed to be the best produced anywhere

In Australia and New Zealand flocks are herded that number as high as 3,000 individuals, but the larger flocks are only penned once or twice a year, being allowed to wander about the rest of the time.

According to some figures published by Poland in 1892, the total number of domesticated sheep in the world in 1889 was over 500,000,000, of which 43,000,000 were credited to the United States, 35,000,000 to the United Kingdom, 80,000,000 to Australia and New Zealand, 30,000,000 to Canada, 22,000,000 to France and 16,500,000 to Spain.

The reports of the Census Bureau of the Department of Commerce and Labor, show that in 1900 the total number of domesticated sheep on the farms in the United States was 60,503,713, and in 1910, 52,447,061, a decrease of 14.4 per cent. The reports of the Department of Agriculture show, that the total number of sheep on the farms in this country, in 1913, was 51,482,000, valued at $202,779,000.

The United States Government reports show that in 1910 the 617,268,700 sheep and lambs in the world were distributed as follows:

Australia	89,780,000
Tasmania	1,896,281
Russian Empire	82,672,123
Argentina	67,211,754
United States	51,819,068
Ottoman Empire	41,000,000
Great Britain	31,164,547
British South Africa	31,102,467
Uruguay	26,286,296
New Zealand	23,996,126
British India	21,824,000
China	18,900,000
France	17,357,640
Spain	15,471,183
Austro-Hungary	13,991,500
Italy	11,160,000
Algeria	9,632,177
Bulgaria	8,132,000
Germany	7,703,710
Roumania	5,655,444
Greece	4,570,000
Chile	4,244,000
Mexico	4,424,000
Peru	3,700,000
Servia	3,160,166
Portugal	3,150.000
Peru	3,000,000
Canada	2,598,470
German East Africa	1,560,000
Sudan	1,421,721
Norway	1,378,517
Sweeden	1,024,500
Denmark	1.003,000
Egypt	920,000
Tunis	585,027
Columbia	746,000
Falkland Island	689,000
Netherlands	607,000
Montenegro	496,856
Iceland	495,100
Central America	442,950
Brazil	380,000
Cyprus	302,000
Belgium	236,000
Switzerland	209,997
Ceylon	96,300
West Indies	51,400
Phillipines	30,400

Of the sheep credited to Great Britain 16,273,518 were in England; 7,144,646 in Scotland; 3,979,516 in Ireland; 3,684,781 in Wales; and 82,126 on the Isle of Man and in Jersey and Guernsey. Of the English sheep 1,024,934 were in Kent; 1,097,923 in Lincoln; 1,140,913 in Northumberland; and 923,755 in Devon. The figures show that there was one sheep for each 2.5 acres of the 17,690,240 acres in the Kingdom of Great Britain, and 1 to each 1.8 acres in England and Wales alone. The United States had 1.36 sheep for each of its 1,903,461,760 acres. At present 57% of the sheep in the United States are in eleven States west of the Rocky Mountains. In 1840 over 66% were in six Eastern and Central States: New York having 5,119,000; Ohio, 2,028,000; Pennsylvania, 1,768,000; Vermont, 1,682,000; Virginia, 1,294,000; Kentucky, 1,008,000. The total number of sheep (excluding lambs) on farms and ranches in the United States in 1860, was 23,975,000; in 1870, 28,478,000; in 1880, 42,192,000; in 1890, 40,876,000; and in 1900, 39,853,000.

In the far west and portions of the state of Ohio wool raising is a separate industry, but in the middle west and east, sheep raising is generally only an incident of a mixed system of husbandry. In 1910 the average number of sheep and lambs to a ranch on the 609,323 sheep farms in the United States was 85, although in some of the far western states the average was over 3,000. The census showed that of the total of 51,809,068 reported from the ranches and farms that year, 31,582,097 were ewes, 7,604,672 were rams and wethers, and 12,622,299 were lambs born after January 1st, 1910.

Of the 91,676,281 in Australia and Tasmania the same year eighty-five per cent were in flocks of 1,000 or over, and fifty per cent in flocks of 10,000 and upward. In Queensland and New South Wales a large percentage of the flocks contained from 20,000 to 50,000 individuals, and some numbered over 100,000 sheep each. The holdings were from 10,000 to 100,000 acres each. 50% of the Australian sheep were in New South Wales; 21.37% in Queensland, 7.07% in South Australia, 5.16% in West Australia, and 1.89% in Tasmania.

The following table shows the total number of sheep in each state and section of the United States in 1910, as well as the number of ranches or farms, and average number of sheep on each.

	No. of Farms and Ranches	Average on Each	No. of Sheep and Lambs
North Atlantic Division	**71,467**	**32**	**2,273,458**
Maine	11,066	19	206,434
New Hampshire	2,226	20	43,772
Vermont	5,033	24	118,551
Massachusetts	1,027	32	32,669
Rhode Island	243	28	6,789
Connecticut	740	30	42,398
New York	24,329	17	39,547
New Jersey	815	35	30,446
Pennsylvania	25,426	35	882,852
South Atlantic Division	**76,188**	**33**	**2,507,417**
Delaware	266	29	3,391
Maryland	6,288	38	110,826
District of Columbia	....	..	......
Virginia	21,496	37	803,552
West Virginia	26,814	35	906,093
North Carolina	14,694	15	214,176
South Carolina	1,721	22	37,433
Georgia	5,126	37	187,589
Florida	663	180	113,631
North Central Division	**326,231**	**45**	**14,595,059**
Ohio	71,523	55	3,907,055
Indiana	38,191	35	1,336,967
Illinois	26,240	40	1,059,672
Michigan	54,865	42	2,306,476
Wisconsin	30,040	31	929,783
Minnesota	24,549	26	637,033
Iowa	44,010	53	637,033
Missouri	21,789	41	1,144,583
North Dakota	3,673	79	289,354
South Dakota	5,155	118	610,928
Nebraska	3,043	96	293,496
Kansas	3,153	86	272,472
South Central Division	**107,441**	**43**	**4,632,651**
Kentucky	45,663	30	1,361,000
Tennessee	29,953	27	793,983
Alabama	6,614	22	142,925
Mississippi	5,687	34	194,280
Louisiana	3,629	49	178,217
Texas	6,683	263	1,758,384
Oklahoma	831	72	59,792
Indian Territory	....	..	......
Arkansas	8,381	17	144,190
Western Division	**27,994**	**993**	**27,800,485**
Montana	2,267	2,370	5,372,639
Wyoming	1,641	3,287	5,274,959
Colorado	1,693	841	1,424,187
New Mexico	3,113	1,049	3,264,612
Arizona	1,025	1,035	1,061,363
Utah	2,416	756	1,826,471
Nevada	316	3,493	1,103,889
Idaho	2,995	985	2,950,534
Washington	2,116	223	471,521
Oregon	6,308	427	2,676,729
California	3,801	508	2,234,125

The "Bighorn" (Ovis-montana) is the only wild sheep indigenous to the North American Continent, and is very closely allied to the **Kamschatka Wild Sheep** (Ovis-nivicola). Both of these species, whose rams attain a height of three and one-half feet at the shoulder and average about three hundred and fifty pounds in weight, can be readily distinguished from the **Argali** (Ovis-ammon) of Mongolia, and the **Wild Sheep of Tibet** (Ovis-hodgsoni), by the character of their skull and horns; the skull of the last two species having a deeper pit for the gland below the eye, and very strongly marked wrinkles on the anterior surface of the enormous horns which are wanting on the horns of the others. The range of the Bighorn extends from Mexico to Alaska, and from the eastern points of the Rocky Mountains to the Pacific Coast. The **Kamschatka** species is found in the Stanovoi Mountains as well as on the peninsula of Kamschatka, where its range is separated by little more than the Bering Strait from the Alaskan habitat of the American species. The skins of the Tibet lambs, sometimes called Mandarin lambs, are white, and the long curly wool is fine and silky; they take the dye beautifully in fancy colors as well as black, but are principally used in their natural state for baby carriage robes and fur sets and trimmings, or are dyed black and made into muffs and boas. Furs made from the skins of the lambs of the domesticated Iceland and China sheep are sometimes sold as Tibet. **The Pamir**, which inhabits and takes its name from the elevated district in central Asia known as "the roof of the world," has longer curved horns, but does not grow to quite the size of the Argali. The horns of some of the male Pamir sheep measure from fifty to sixty inches along the outer curve.

The Armenian and Cyprian Sheep (Ovis-gnelini and Ovis-ophion) are two small species distinguished by dark colored tails and the absence of horns in the ewes. The Armenian sheep is the larger of the two, standing about two feet nine inches. The horns of the males, which have a peculiar backward and inward curve until they nearly meet at the back of the neck, rarely exceed twenty inches in length. The color of the body of these sheep is white with the exception of the upper parts which are a russet yellow. The females have a characteristic white saddle mark on the back.

The Mouflon (Ovis-musimon) is probably the ancestor of some of the long wool artificial breeds with short flat tails and cresentic horns; the origin of some of the tight wool varieties like the Southdowns could possibly be traced back to the fat tail, and it seems certain that the broad tail sheep of Persia, the Arabis and Doozbais of Bokhara, and the other producers of close spiral curled lambs, like the Astrachan, Persian and Ukranier, are strains of the now extinct Ovis-platyura, the original broad tail.

The Mouflon is a species entirely confined to the Islands of Corsica and Sardinia. It is of compact build and stands about twenty-eight inches high. The general color is a fox red shading to a light grey on the head; the under part of the body, sides and tail, cheeks and parts of the lower legs are white. Mouflons generally frequent the highest peaks of the mountain ranges in their habitat, where they can command a full view of the surrounding country. In the pairing season, which occurs in December and January, they divide into small parties consisting of one ram and several ewes; the lambs—either one or two at a birth—are produced in May, and within a few days after they are born are able to follow the ewes everywhere. The fact that the wild Mouflon occasionally desert their own kin to live among tame sheep, and that motherless domestic lambs have been known to seek companionship among a flock of Mouflon, is the strongest evidence that the wild sheep and domesticated breeds are very closely related.

The Asiatic wild sheep(Ovis-vignei) known in Punjab as the **Urial** and in Ladok as the **Sha,** is distinguished from the preceding species by its smaller size, more diminutive horns, and the presence of a large ruff of long hair on the throat, which is much less developed in the Sha than in the Urial. The range of this species extends from northern Tibet to Afghanistan and into eastern Persia, and is generally at elevations of from twelve to fourteen thousand feet. The Urial stands about two feet eight inches at the shoulders, and the Sha sometimes attains a height of three feet.

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